19th Annual Meeting, American College of Chest Physicians
New York City, May 28 - 31, 1953

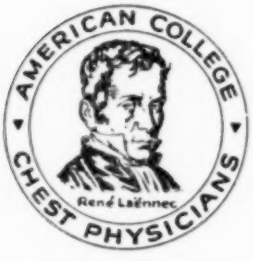
VOLUME XXIII NUMBER 4

DISEASES

of the

CHEST

OFFICIAL PUBLICATION



PUBLISHED MONTHLY

APRIL
1953

Give!
1953 RED CROSS FUND

PUBLICATION OFFICE, ALAMOGORDO ROAD, EL PASO, TEXAS
EXECUTIVE OFFICE, 112 EAST CHESTNUT STREET, CHICAGO 11, ILLINOIS

Entered as Second Class Matter August 18, 1936, at the Postoffice at El Paso, Texas
Under the Act of Congress of August 12, 1912.
Copyright, 1953, by the American College of Chest Physicians

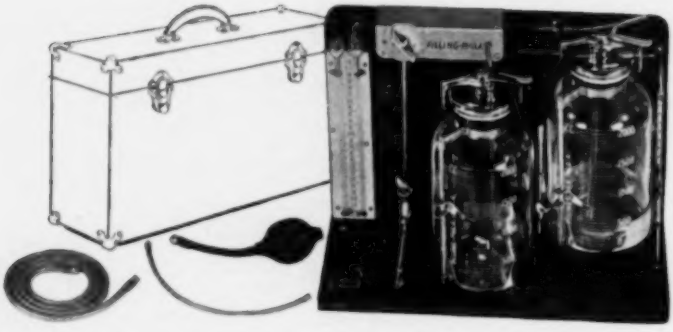
THE NEW CONTINUOUS MODEL

for pneumothorax or pneumoperitoneum

The Cutler

Continuous Pneumothorax Apparatus

by Pilling



designed by J. W. Cutler, M.D., Philadelphia

This newly designed pneumothorax apparatus features a unique new control valve which makes air available from either bottle. This assures a continuous and inexhaustible supply of filtered air—ending the nuisance of pumping water from one bottle to another.

Extremely useful for routine administration of pneumothorax as well as for office or institutional use where many refills or large quantities of air must be administered.

This new Cutler apparatus has many features which make it a safe instrument, easy to operate—a few of them are: direct reading manometer with safety traps on both arms, sliding indicators on both bottles, Pilling Quick Detachable bottle tops.

ALSO AVAILABLE | *A portable model which incorporates the same continuous principle; weighs only 12½ pounds complete.*

Order direct from **GEORGE P. Pilling & SON CO.**

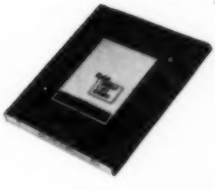
3451 WALNUT STREET • PHILADELPHIA



For superior radiographic results, follow this simple rule:



Use
Kodak Blue Brand
X-ray Film



Expose with
Kodak Contact X-ray
Screens (THREE TYPES)



Process in
Kodak Chemicals
(LIQUID OR POWDER)

Order from your x-ray dealer

His goal is exactitude . . .

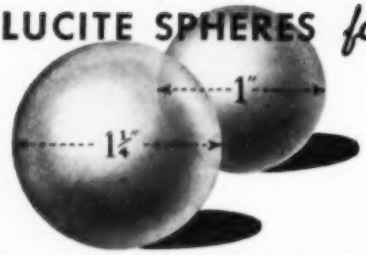
Whether at home, absorbed in his hobby, or at his office, busy with patients, the radiologist is concerned with every detail. His demand is for accuracy, exactitude.

That's why, without a doubt, he requires the finest, most advanced equipment, the most responsive and reliable x-ray film, the most uniform and effective processing chemicals. And that's the reason he almost always specifies Kodak x-ray materials . . . each product made to work with the other, each prepared to produce superior results.

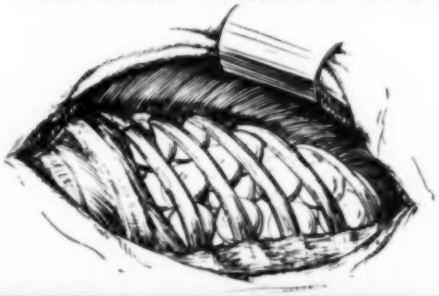
EASTMAN KODAK COMPANY
MEDICAL DIVISION, ROCHESTER 4, N. Y.

Kodak
TRADE-MARK

LUCITE SPHERES *for Plumbage Thoracoplasty*



. . . as used by the
OVERHOLT THORACIC CLINIC



Lucite Spheres, 1¼" or 1" (in diam.) . . . $.30 ea.
Polyethylene Film, Animal Tested, (Used for encasing Spheres)

54" x .015 . . . 10 yds. $7.50
54" x .002 . . . 10 yds. $7.50

ORDER DIRECT FROM:

ESTABLISHED 1838

Codman & Shurtleff, Inc.
MAKERS OF SURGEONS' INSTRUMENTS
104 BROOKLINE AVENUE BOSTON 15, MASSACHUSETTS



SPECIFY
BIO
VITAMINS

VICAP FORTIOR

BALANCED (Improved) HIGH POTENCY
— For General Therapeutic Use —

A valuable supplement in the regimen of the tuberculosis patient to assist in rectifying deficiencies caused by:
Febrile conditions — Poor Nutrition — Faulty Absorption

Vitamins and Minerals Plus Choline, Inositol and dl-methionine.

VITAMINS, PER CAPSULE:	
Vitamin A (Synthetic Vitamin Palmitate)	12,500 USP Units
Vitamin D (Irradiated Ergosterol)	1,000 USP Units
Vitamin B-1 (Thiamine Hydrochloride, USP)	5 mg.
Vitamin B-2 (Riboflavin, USP)	2.5 mg.
Vitamin B-6 (Pyridoxine Hydrochloride)	0.5 mg.
Vitamin B-12, USP	1 microgram
Vitamin C (Ascorbic Acid, USP)	75 mg.
Niacin Amide, USP	40 mg.
Calcium Pantothenate	4 mg.
Vitamin E (d-alpha Tocopherol Acetate [from vegetable oils] equivalent by biological assay to 2 I. U. Vitamin E)	
Folic Acid, USP	0.5 mg.

MINERALS, PER CAPSULE	
Ca (from DiCalcium Phosphate, Anhydrous)	75 mg.
P (from DiCalcium Phosphate, Anhydrous)	58 mg.
Fe (from Ferrous Sulfate, Dried, USP)	30 mg.
Cu (from Copper Sulfate, Monohydrate)	0.45 mg.
Mn (from Manganese Sulfate, Dried)	0.5 mg.
K (from Potassium Sulfate)	2 mg.
Mg (from Magnesium Sulfate, Dried)	3 mg.
I (from Potassium Iodide, USP)	0.075 mg.
Co (from Cobalt Sulfate)	0.04 mg.
Mo (from Sodium Molybdate)	0.1 mg.
Zn (from Zinc Sulfate, Dried)	0.5 mg.

Choline Bitartrate, 31.4 mg. Inositol, 15 mg. dl-Methionine, 10 mg.

Biochemical Research Laboratories, Inc.
One East Walton Place Chicago 11, Illinois

DISEASES *of the* CHEST

OFFICIAL PUBLICATION

OF THE

AMERICAN COLLEGE OF CHEST PHYSICIANS

EDITORIAL BOARD

JAY ARTHUR MYERS, M.D., Chairman
Minneapolis, Minnesota
Editor-in-Chief

CHARLES M. HENDRICKS, M.D.
El Paso, Texas
Editor Emeritus

MILTON W. ANDERSON, M.D.
Rochester, Minnesota

RICHARD H. OVERHOLT, M.D.
Brookline, Massachusetts

ANDREW L. BANYAI, M.D.
Milwaukee, Wisconsin

HENRY C. SWEANY, M.D.
Jacksonville, Florida

ASSOCIATE EDITORS

ANTONIO A. ADAMES, M.D.	Holtville, California
WILLIAM B. BEAN, M.D.	Iowa City, Iowa
EDWARD P. EGLEE, M.D.	New York, New York
SEYMOUR M. FARBER, M.D.	San Francisco, California
EDWARD W. HAYES, M.D.	Monrovia, California
HANS H. HECHT, M.D.	Salt Lake City, Utah
PAUL H. HOLINGER, M.D.	Chicago, Illinois
CHEVALIER L. JACKSON, M.D.	Philadelphia, Pennsylvania
HOLLIS E. JOHNSON, M.D.	Nashville, Tennessee
ARTHUR M. MASTER, M.D.	New York, New York
EDGAR MAYER, M.D.	New York, New York
ALTON OCHSNER, M.D.	New Orleans, Louisiana
GEORGE G. ORNSTEIN, M.D.	New York, New York
J. WINTHROP PEABODY, M.D.	Washington, D. C.
ARTHUR Q. PENTA, M.D.	Schenectady, New York
LEO G. RIGLER, M.D.	Minneapolis, Minnesota

CORRESPONDING ASSOCIATE EDITORS

Donato G. Alarcon, M.D., Mexico
Adrian Anglin, M.D., Canada
Jose Ignacio Baldo, M.D., Venezuela
Etienne Bernard, M.D., France
Miguel Canizares, M.D., Philippine Is.
Manoel de Abreu, M.D., Brazil
Lopo de Carvalho, M.D., Portugal
Sir Alexander Fleming, M.D., England
Ovidio Garcia Rosell, M.D., Peru
Fernando D. Gomez, M.D., Uruguay
Affonso MacDowell, M.D., Brazil
David P. Marais, M.D., South Africa
Amadeo V. Mastellari, M.D., Panama
Gustav Maurer, M.D., Switzerland
Andre Meyer, M.D., France
Papken S. Mugriditchian, M.D., Lebanon
Antonio Navarrete, M.D., Cuba
Juda M. Pauzner, M.D., Israel
Hector Orrego Puelma, M.D., Chile
Raul P. Vaccarezza, M.D., Argentina
Raman Viswanathan, M.D., India
Harry W. Wunderly, M.D., Australia
Attilio Omodei Zorini, M.D., Italy

EXECUTIVE OFFICE
112 East Chestnut Street, Chicago 11, Illinois
MURRAY KORNFELD, *Managing Editor*

VOLUME XXIII APRIL 1953 NUMBER 4

CONTENTS:

BIOPSY TECHNIQUES IN THE DIAGNOSIS OF INTRATHORACIC LESIONS 357
Clifford F. Storey, Captain (MC) and
Benedict M. Reynolds, Lt. (jg) (MC), St. Albans, New York

DETECTION OF CARDIAC ABNORMALITIES BY MASS CHEST X-RAY SURVEYS 383
G. Howard Gowen, M.D., Springfield, Illinois

VARIATIONS IN THE BETA-GLUCURONIDASE ACTIVITY OF TUBERCULOUS PLEURAL EFFUSIONS 390
S. H. Yawrence, M.D., San Fernando, California

MEDIASTINAL EMPHYSEMA FOLLOWING TONSILLECTOMY 397
Jacob J. Silverman, M.D., Theodore J. Talbot, M.D. and
Robert W. McClean, M.D., Staten Island, New York

THE CORRELATION OF CARCINOMA AND CONGENITAL CYSTIC EMPHYSEMA OF THE LUNGS 403
Ephraim Korol, M.D., Spivak, Colorado

PULMONARY EMPHYSEMA AND FIBROSIS 412
Samuel S. Altshuler, M.D., Fred S. Preuss, M.D.,
Frank G. Drischel, M.D. and James E. O'Hare, M.D., Tucson, Arizona

SEGMENTAL POSTURAL DRAINAGE IN PULMONARY DISEASE 418
Irving J. Kane, M.D., New York, New York

ONE STAGE THORACOPLASTY USING AN ADHESIVE HEMICAST 428
W. G. Trapp, M.D., Vancouver, B. C., Canada

THE MECHANISM OF HEALING OF LUNG CAVITIES 439
Halim A. Zaki, M.D. and A. Rida, M.D., Alexandria, Egypt

SARCOIDOSIS: TREATMENT WITH CORTISONE, ACTH AND URETHANE 444
Michael F. Koszalka, M.D. and Arthur C. Fortney, M.D.,
Fargo, North Dakota

LIPOID CELL PNEUMONIA: REPORT OF A CASE 452
Joseph M. Miller, M.D. and Milton Ginsberg, M.D.,
Ft. Howard, Maryland

19th ANNUAL MEETING 456
Information Form and Reservation Form 467
American College of Chest Physicians

COLLEGE CHAPTER NEWS 469

COLLEGE NEWS NOTES 473

BOOK REVIEWS 474

COLLEGE EVENTS xiv

MEDICAL SERVICE BUREAU xxiv

Entered as second class matter, August 18, 1936, at the postoffice at El Paso, Tex., under the Act of August 24, 1912

Annual Subscription: $12.50, Postpaid to any part of the World.

Announcing

a new antibacterial combination



Gantricillin is the new combination of Gantrisin 'Roche' (the single, more soluble sulfonamide) plus penicillin.

Gantricillin is recommended for infections susceptible to penicillin or sulfonamides. It is especially useful when the causative organisms are more susceptible to the combination than to either drug alone. Each scored tablet contains 0.5 Gm Gantrisin and 100,000 units of crystalline penicillin G potassium.

Hoffmann-La Roche Inc., Nutley 10, N. J.

GANTRISIN®—brand of sulfisoxazole
GANTRICILLIN™

The Drs. J. M. Chamberlain
and C. Daniels

VACUUM PUMP



$59.00 DELIVERED

This pump is especially designed to take the place of heavy cumbersome equipment and eliminates repairs of burned out motors. It is driven by a brushless motor, is almost noiseless, *can be run indefinitely*, and needs oiling but twice a year.

There is a pressure outlet on this pump which is ideally suited to be attached to your Pneumothorax Apparatus for the treatment of Pneumoperitoneum.

Vaccum 15"
Air Displacement 3000 ccm. per min.
A. C. Only 115 Volts
60 Cycles .5 Amps

Patent No. 2,575,398 - Others Pending
Made in U. S. A.

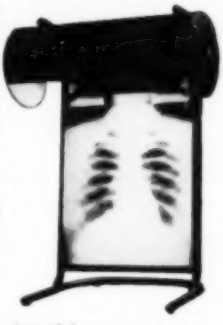
See your dealer or write to:

IMPORTED SPECIALTIES AND SUPPLIES, INC.
BOONTON, NEW JERSEY

POWERS
X-RAY PAPER
REDUCES
COSTS
50%
OR MORE!



For most routine work, radiographs of high quality can be made at less than half the usual cost with Powers X-Ray Paper. That is why more and more hospitals are using *both* paper and celluloid base film in their X-Ray departments. Techniques differ only slightly.



Proven in use for over 16 years, Powers X-Ray Paper comes in standard sheet sizes, or perforated rolls for use with the Powers Magazine Cassette.

Let us show you in detail how you can effect substantial savings with Powers X-Ray Paper. Write for complete information and literature.

POWERS X-RAY PRODUCTS, INC.

Reg. U. S. Pat. Off.
POWERS X-RAY PRODUCTS
Group Radiography
Glen Cove, Long Island, N. Y.

Always ready to abort the Bronchospasm



easy to carry...
in pocket or purse



WITH THIS quick-acting bronchodilating powder, it is now possible for many chronic asthmatics to lead useful, happy lives. When the asthmatic feels a bronchospasm impending he can merely take three or four inhalations of NORISODRINE Sulfate Powder and the attack usually subsides at once.

The patient carries this therapy with him. He uses the AEROHALOR, Abbott's handy, smoke-it-like-a-pipe powder inhaler. No need to leave the job, no injections, no cumbersome equipment.

Clinical investigators[1,2,3] have found NORISODRINE effective against both mild and severe asthma. The drug is a sympathomimetic amine with a marked bronchodilating effect and relatively low toxicity. With proper administration, side effects are few and usually minor.

Before prescribing this potent drug, however, the physician should familiarize himself with administration, dosage and precautions. Professional literature may be obtained by writing Abbott Laboratories, North Chicago, Illinois. Abbott

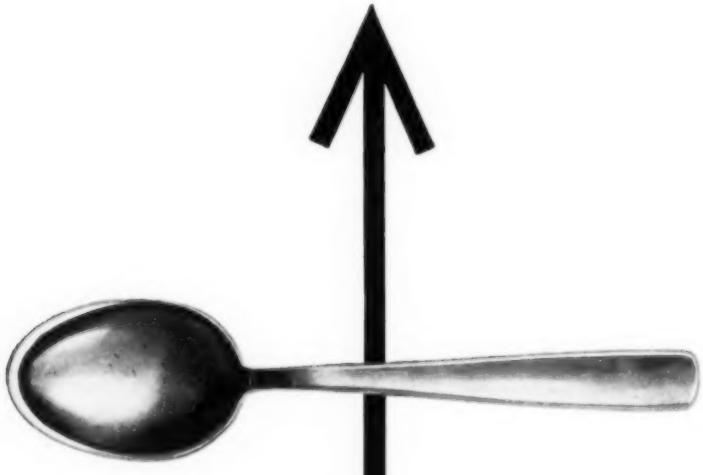
Norisodrine®
SULFATE POWDER
(ISOPROPYLARTERENOL SULFATE, ABBOTT)

for use with the AEROHALOR®
ABBOTT'S POWDER INHALER

1. Kaufman, R., and Farmer, L. (1951), Norisodrine by Aerohalor in Asthma, Ann. Allergy, 9:89, January-February.
2. Swartz, H. (1950), Norisodrine Sulphate (25 Per Cent) Dust Inhalation in Severe Asthma, Ann. Allergy, 8:488, July-August.
3. Krasno, L., Grossman, M., and Ivy, A. (1949), The Inhalation of 1-(3',4'-Dihydroxyphenyl)-2-Isopropylaminoethanol (Norisodrine Sulfate Dust), J. Allergy, 20:111, March.

16

for higher penicillin **blood levels**



rely on the **ESKACILLINS***

the palatable liquid penicillin preparations for oral use

Because they are readily soluble in gastric juice, the 'Eskacillins' are more rapidly absorbed than are the newer, highly insoluble salts of penicillin such as benzethacil. Consequently, you obtain far higher blood levels with the 'Eskacillins'.

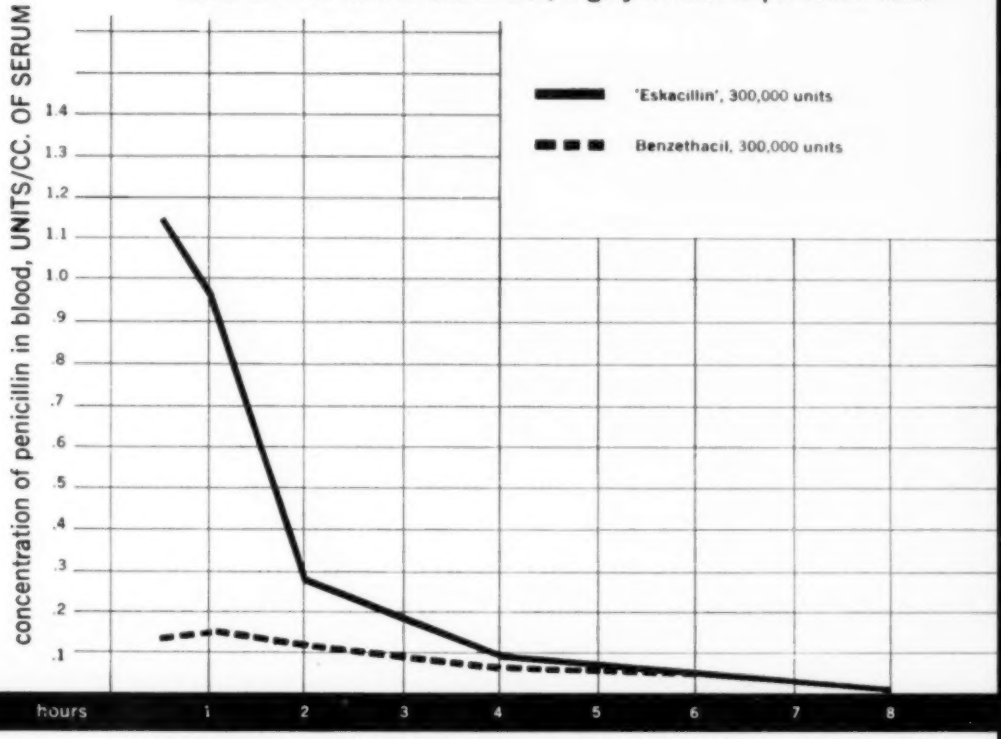
Smith, Kline & French Laboratories, Philadelphia

*T.M. Reg. U.S. Pat. Off.

A comparison of the average serum concentrations in the same patients after a single oral dose . . .

(averages of a series of patients, oral fasting)

'Eskacillin' vs. one of the newer, highly insoluble penicillin salts



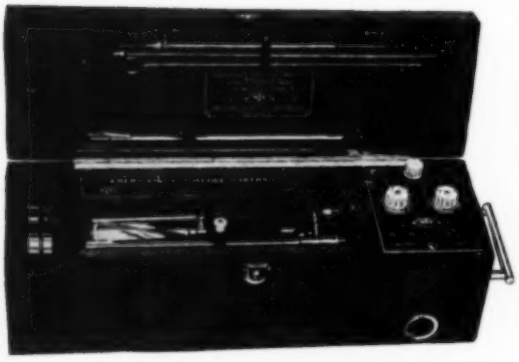
Source: Foltz, E. L., and Schimmel, N. H.: Antibiotics & Chemotherapy, to be published.

per teaspoonful — 5cc — *the 'Eskacillins'*

'Eskacillin 50'	50,000 units potassium penicillin G
'Eskacillin 100'	100,000 units potassium penicillin G
'Eskacillin 250'	250,000 units procaine penicillin G
'Eskacillin 500'	500,000 units procaine penicillin G
'Eskacillin 100-Sulfas'	100,000 units potassium penicillin G plus 0.5 Gm. of three sulfonamides (sulfadiazine, sulfamerazine, sulfamethazine)
'Eskacillin 250-Sulfas'	250,000 units procaine penicillin G plus 0.5 Gm. of three sulfonamides (sulfadiazine, sulfamerazine, sulfamethazine)

The Coryllos Thoracoscope

WITH SELF-CONTAINED CAUTERY AND LIGHT TRANSFORMER



600A as illustrated with footswitch and cautery-light transformer. The biopsy forceps illustrated in lid of case is an accessory instrument and is sold separately.

Biopsy Forceps, Cat. No. 389

A sturdy portable instrument for the double cannula pneumonolysis technique, which adequately meets the requirements of the American surgeon. The Coryllos Thoracoscope consists of telescope, two cannulae, light carrier, two extra lamps and sterilizable lighting cord. The long and short cautery electrodes are equipped with ventilating shields which permit air circulation in the pleural cavity. The self-contained cautery and light transformer obviates the necessity of purchasing relatively expensive high-frequency generators and transformers. The instrument is contained in a polished, substantial walnut case with carrying handle. A space is provided for the footswitch which is included.

Supplementary instruments such as curved electrodes, flexible cannula, transilluminator and aspirating tube, biopsy specimen forceps, infiltration needle, etc. are also available for those who desire a more elaborate armamentarium.

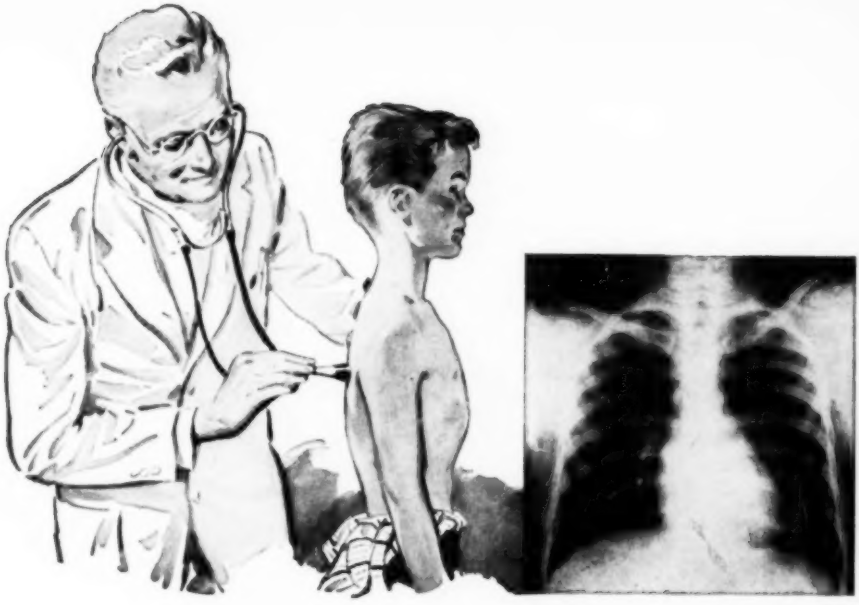
Consult your Dealer or Write to us for Literature

WAPPLER ACME TRADE MARK

AMERICAN CYSTOSCOPE MAKERS, INC.

1241 LAFAYETTE AVENUE, NEW YORK 59, N. Y.

When writing please mention *Diseases of the Chest*



A drug of choice in tuberculosis

As therapeutically active as streptomycin, CRYSTALLINE DIHYDROSTREPTOMYCIN SULFATE MERCK is less toxic to the vestibular apparatus, minimizes pain and swelling on injection, and may be used even in some patients allergic to streptomycin.

This preferred product is available in dry powder form and in convenient ready-to-inject form as SOLUTION OF CRYSTALLINE DIHYDROSTREPTOMYCIN SULFATE MERCK.

PARA-AMINOSALICYLIC ACID MERCK (PAS), when used in combination with CRYSTALLINE DIHYDROSTREPTOMYCIN SULFATE MERCK, prolongs the effective period of antibiotic therapy by inhibiting or delaying the development of bacterial resistance.

Crystalline Dihydrostreptomycin Sulfate Merck

COUNCIL ACCEPTED

Research and Production for the Nation's Health

MERCK & CO., INC.
Manufacturing Chemists
RAHWAY, NEW JERSEY

New principle
in
Streptomycin Therapy

The hazard of ototoxicity is greatly reduced by combining equal parts of streptomycin sulfate and dihydrostreptomycin sulfate. The patient thus gets only *half* as much of each drug. The risk of vestibular damage (from streptomycin) and of hearing loss (from dihydrostreptomycin) is greatly reduced. Therapeutic effect is undiminished. This principle has been demonstrated in both animals and man. In patients treated for 120 days with 1 Gm. per day of the combined drugs, the incidence of neurotoxicity was practically zero.



Cat treated with streptomycin is ataxic.



Cat treated with the same amount of streptomycin-dihydrostreptomycin has normal equilibrium.

DISTRYCIN
(di-STRI-sin)

Squibb Streptomycin Sulfate *and* Dihydrostreptomycin Sulfate in equal parts

FOR GREATER SAFETY IN COMBINED ANTIBIOTIC THERAPY

These new formulations embody this new principle:

	DISTRYCIN	DICRYSTICIN	DICRYSTICIN FORTIS	DISTRYCILLIN A. S.
Streptomycin sulfate, Gm.	0.5	0.25	0.5	0.25
Dihydrostreptomycin sulfate, Gm.	0.5	0.25	0.5	0.25
Procaine penicillin G, units	—	300,000	300,000	400,000
Potassium penicillin G, units	—	100,000	100,000	—

(All supplied in 1 and 5 dose vials)

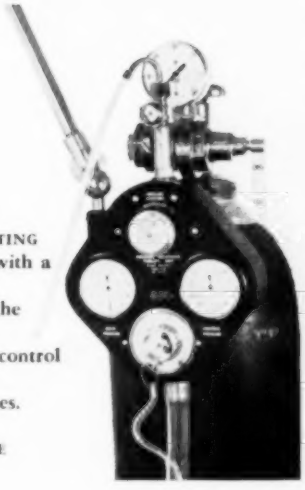
SQUIBB
a leader in the research and manufacture of penicillin and streptomycin

'Distrycin' and 'Dicrysticin' are registered trademarks; 'Distrycillin' is a trademark.



for successful treatment of acute and chronic pulmonary disorders

the BENNETT PRESSURE BREATHING THERAPY UNIT



DESIGNED TO PROVIDE SAFE, EFFECTIVE BREATHING assistance with simultaneous bronchodilator or antibiotic aerosol administration in all types of acute and chronic respiratory insufficiency.

RESPIRATORY ASSISTANCE IS ACCOMPLISHED BY ACTIVELY INFLATING the lungs under safe controlled pressure during inspiration with a resulting increase in depth and volume of breathing, then allowing free exhalation without pressure. The unique features of the truly flow-sensitive Bennett Valve makes this the ideal treatment unit for intermittent positive pressure breathing. Complete patient control of breathing rate and rhythm is maintained at high or low rates of flow, thus achieving deep, effective breathing even in advanced cases.

EXTENSIVE CLINICAL DATA AND RESEARCH PAPERS SUBSTANTIATE the good results obtained in a high percentages of cases treated with the Bennett Unit. Effective relief from dyspnea, together with physiological therapy has been accomplished in both acute and chronic respiratory complications. These include emphysema, bronchiectasis, silicosis, asthma, atelectasis, cor pulmonale, pulmonary fibrosis, pulmonary edema, poliomyelitis, some cardiac conditions, barbiturate poisoning, post-operative complications, and other conditions involving insufficiency of respiratory ventilation. Now widely used by doctors, hospitals, and many individual patients.* Information, descriptive literature, and reprints available on request.

V. RAY BENNETT & ASSOCIATES, Inc.

320 South Robertson Boulevard

Los Angeles 48, California

*Note: units sold only on the prescription or order of a physician or a qualified hospital or institution.

Can YOU Answer These Vital PULMONARY FUNCTION QUESTIONS?

- **Is there a consistent relationship between vital capacity and dyspnea?**
- **In emphysema, what is the correlation between expiration time, shortness of breath and maximum breathing capacity?**
- **What is the best method of measuring alveolar air?**
- **What is the minimum maximum breathing capacity necessary, following operation to assure freedom from dyspnea?**
- **Does thoracoplasty really reduce ventilation function?**
- **Are pulmonary function tests valuable in pneumothorax?**
- **How much does phrenic nerve interruption lower the MBC?**
- **Does pneumoperitoneum reduce MBC sufficiently to be contraindicated?**
- **Why are repeated pulmonary function tests a must in the post-operative follow-up of pulmonary resection?**
- **Why is separate reserve air determination so important?**

Visit Booth No. 5 and See Our Exhibit at Hotel New Yorker.

THIS NEW REPRINT HAS THE ANSWERS

By JOHN J. CURRY & FRANK S. ASHBURN of Georgetown Univ. Medical Center entitled PULMONARY FUNCTION STUDIES IN SURGERY. The above questions and many more are given in this latest reprint. Collins equipment has contributed greatly to the simplicity of pulmonary function studies. Ask for present prices and descriptive literature.

NEW **COLLINS (DOUBLE) BRONCHO-SPIROMETER**

Built to Dr. E. A. Gaensler's Specifications Boston City Hospital

WARREN E. COLLINS, INC.*
555 Huntington Avenue
Boston 15, Massachusetts

Please send me the reprint by Curry and Ashburn and information on:

( ) Respirometer ( ) Timed Vital ( ) Gasometer
( ) COLLINS DOUBLE BRONCHO-SPIROMETER

Dr. _____

Street _____

City _____ Zone _____

State _____ DC

COLLEGE EVENTS

NATIONAL AND INTERNATIONAL MEETINGS

19th Annual Meeting,
American College of Chest Physicians
Hotel New Yorker, New York City,
May 28-31, 1953.

Third International Congress on Diseases of the Chest
Barcelona, Spain, Fall of 1954.

POSTGRADUATE COURSES

8th Annual Postgraduate Course on Diseases of the Chest
Knickerbocker Hotel, Chicago, Illinois,
September 28 - October 2, 1953.

6th Annual Postgraduate Course on Diseases of the Chest
Hotel New Yorker, New York City,
November 2-6, 1953.

CHAPTER MEETINGS

Florida Chapter, Hollywood, Florida,
April 26, 1953.

Texas Chapter, Shamrock Hotel,
Houston, Texas, April 27, 1953.

Virginia Chapter, Hotel Jefferson,
Richmond, Virginia, May 6, 1953.

New York Chapter,
Buffalo, New York, May 7, 1953.

Pennsylvania Chapter, Philadelphia,
Pennsylvania, May 7, 1953.

North Carolina Chapter, Pinehurst,
North Carolina, May 10-13, 1953.

Georgia Chapter, De Soto Hotel,
Savannah, Georgia, May 13, 1953.

Illinois Chapter, Sherman Hotel,
Chicago, Illinois, May 19, 1953.

Minnesota Chapter, St. Paul Hotel,
St. Paul, Minnesota, May 20, 1953.

New Jersey Chapter, Haddon Hall,
Atlantic City, N. J., May 20, 1953.

California Chapter, Hotel Biltmore,
Los Angeles, California, May 27, 1953.

New England States Chapter,
Deaconess Hospital, Boston, Mass.,
May 20, 1953.

When writing please mention *Diseases of the Chest*

The Dual Purpose Unit

for

DAY AND NIGHT PROTECTION

in

BRONCHIAL ASTHMA



A single package, a single prescription, yet two dosage forms are the unique advantages of the DAINITE® Unit for around the clock protection of the asthmatic patient. Continuous therapy is thereby supplied based on the fundamental difference between the day and night requirement of bronchial asthma. Both Day and Nite tablets provide fully effective therapy against asthmatic attacks; a significant modification of the Nite tablet specifically protects sleep. Striking objective improvement in pulmonary function, together with good tolerance, has been reported with DAINITE.[1,2,3,4]

Supplied as the DAINITE UNIT containing 48 Day Tablets and 18 Nite Tablets in a unique dispensing unit. Day and Nite tablets are also available separately, to simplify prescription and refill according to individual needs.

References: (1) Segal, M. S.: Springfield, Charles C. Thomas, 1950, p. 83; (2) Barach, A. L.: J.A.M.A. *147*: 730-737, 1951; (3) Segal, M. S., et al.: Ann. Allergy 9: 782-793, 1951; (4) Bickerman, H. G., and Beck, G.: Personal Communication.

IRWIN, NEISLER & COMPANY • DECATUR, ILL.

Research to Serve Your Practice

DAINITE

Each DAY tablet contains:		Each NITE tablet contains:
.....	Phenobarbital	⅜ gr.
¼ gr.	Sodium Pentobarbital	½ gr.
3 gr.	Aminophylline	4 gr.
¼ gr.	Ephedrine HCl	
¼ gr.	Ethyl Aminobenzoate	¼ gr.
2½ gr.	Aluminum Hydroxide	2½ gr.
Give t.i.d.a.c.		Give at 10 P.M.





Hotel New Yorker

Mark Your

Calendar Now . . .

The Meeting

of the Year in

Diseases of the Chest

MAY 28 - 31, 1953

19th Annual Meeting
AMERICAN COLLEGE OF CHEST PHYSICIANS
Hotel New Yorker – New York City

Many Scientific and Social Events have been planned for your interest and enjoyment.

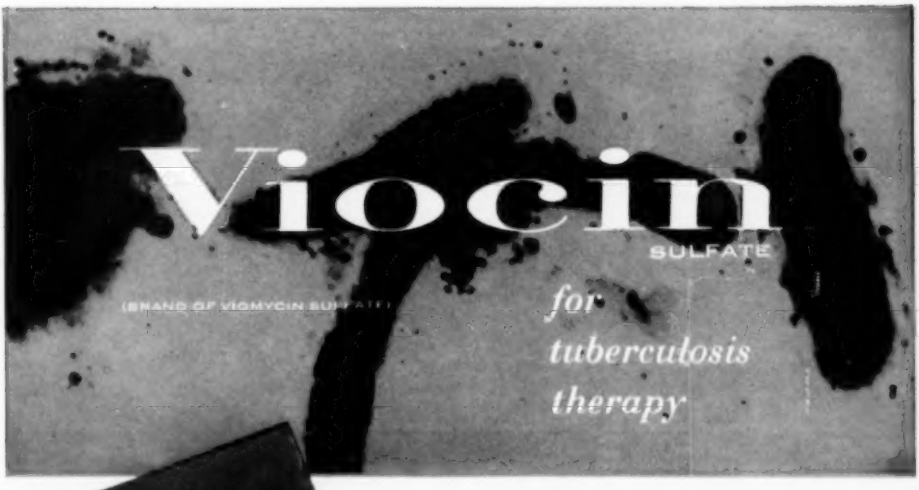
The complete program for the 19th ANNUAL MEETING will appear in the April issue of DISEASES OF THE CHEST. Look for it!

The Annual Session of the American Medical Association will be held in New York City, June 1 through 5, 1953.

For further information please write the Executive Director,
American College of Chest Physicians,
112 East Chestnut Street, Chicago 11, Illinois

When writing please mention *Diseases of the Chest*

a new achievement of Pfizer research



now released for clinical use

From the research laboratories of the world's largest producer of antibiotics comes Viocin — a new antibiotic with important activity against *Mycobacterium tuberculosis.*

A pioneer in the development of streptomycin, dihydrostreptomycin and isoniazid, Pfizer thus adds another powerful agent to the modern management of tuberculosis.

Viocin therapy will be particularly valuable when other medication cannot be used, and as an adjunctive measure in serious, progressive tuberculosis and many cases of extrapulmonary tuberculosis.

Viocin is supplied as the sulfate, for intramuscular injection.

For further details, see your Pfizer Professional Service Representative.

Pfizer ANTIBIOTIC DIVISION • CHAS. PFIZER & CO., INC.
BROOKLYN 6, N. Y.

NEW

NONTOXIC DETERGENT
FOR INHALATION...

ALEVAIRE

TRADE MARK

Liquefies

PULMONARY SECRETIONS
IN
Tuberculosis • Bronchial Asthma • Bronchiectasis
Bronchitis • Bronchopneumonia, etc.

Alevaire is an aqueous solution of a new nontoxic detergent, oxyethylated tertiary octylphenolformaldehyde polymer, 0.125 per cent, in combination with sodium bicarbonate 2 per cent and glycerin 5 per cent.

Alevaire is inhaled by means of any standard aerosol or nebulizer technic.

Life Saving in Neonatal Asphyxia

WRITE FOR INFORMATIVE LITERATURE.

Alevaire is also serviceable as a vehicle for penicillin, streptomycin,* decongestants (such as Neo-Synephrine®) or bronchodilators (such as Isuprel®).

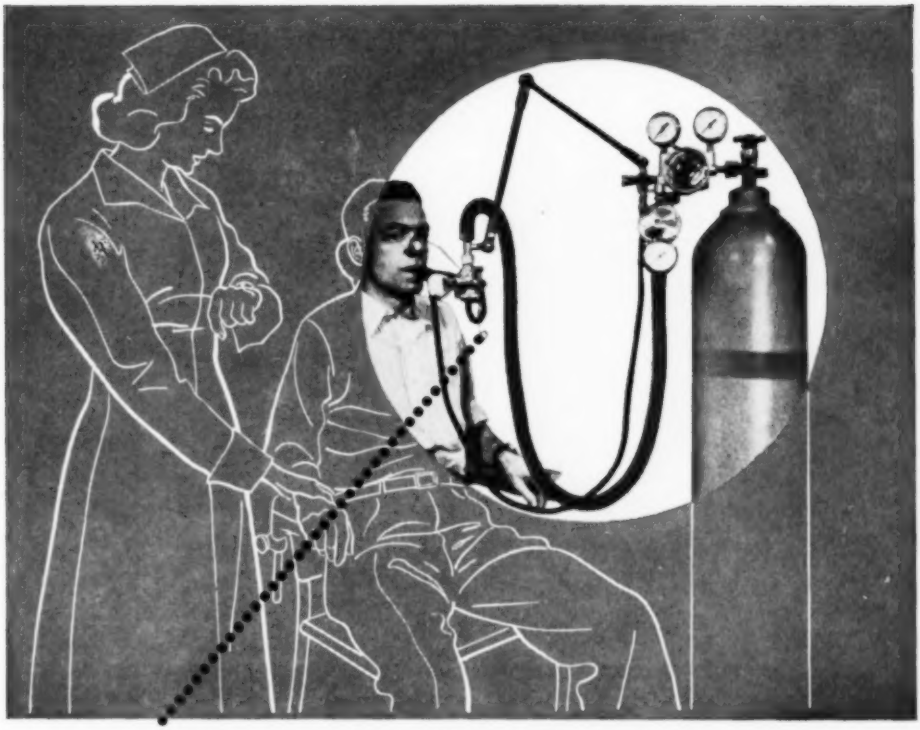
Usual Dose: 500 cc. by aerosolization in 24 hours.
Available in bottles of 500 cc.

WINTHROP-STEARNS INC. NEW YORK 18, N. Y. • WINDSOR, ONT.

*Terramycin is incompatible.

Neo-Synephrine and Isuprel, trademarks reg. U.S. & Canada, brand of phenylephrine and isopropylarterenol, respectively.

739 M



for Symptomatic relief of Bronchospasm

. . . the M·S·A PULMONARY VENTILATOR

Here's a modern instrument designed *specifically* for intermittent positive pressure therapy. Clinically proved, the M.S.A. Pulmonary Ventilator assures effective distribution of aerosols, such as bronchodilators and bacterio-static agents, throughout the respiratory tract. The unit can be used on any standard oxygen cylinder. Its ease of operation permits quick and efficient application in hospitals, doctors' offices, or in the patient's home under the physician's directions.

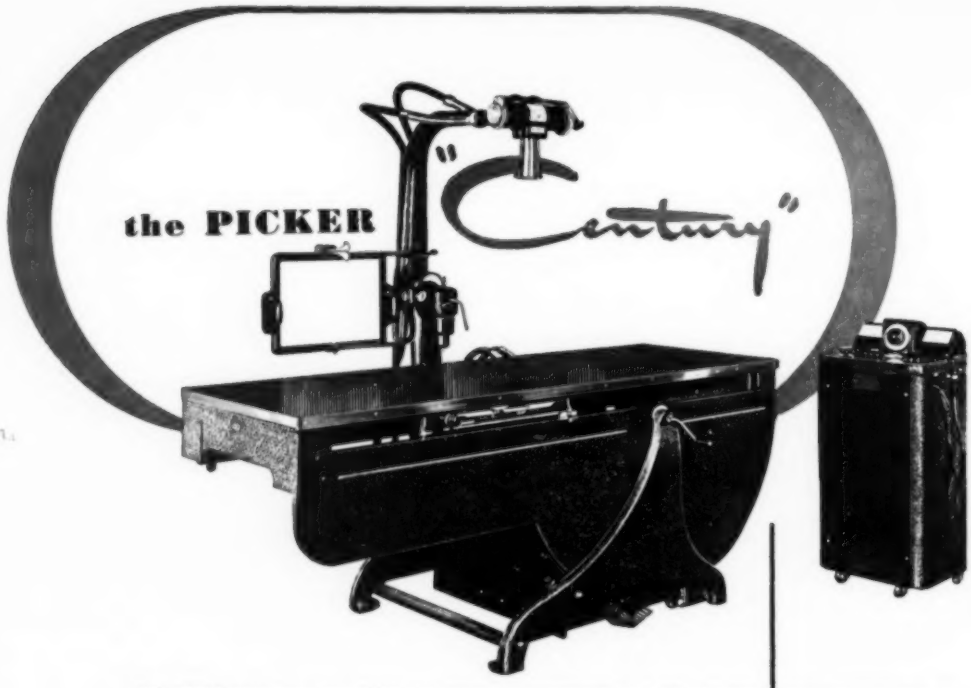
Our bulletin describes the instrument's many uses in inhalational therapy—operating features—ease of maintenance. Write for your copy today. Price of M.S.A. Pulmonary Ventilator with mouthpiece assembly and Nebulizer attachment—$195.00.

MSA
SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY

Braddock, Thomas and Meade Streets
Pittsburgh 8, Pa.

At Your Service:
82 Branch Offices in the United States and Canada



it's so *easy to use* ... the automatic "Century" Control *really* monitors operation; relieves you of technical worries.

it's so *dependable* ... identical "Century" settings produce identical results time after time – yesterday, today, tomorrow.

it's so *trouble-free* ... "Century" stamina has been amply proven in the experience of thousands and thousands of users the world over.

it's so *handsome* ... looks as distinguished as it is. Owners are *proud* of their "Centurys".

Definitely the *fine* x-ray unit in the moderate price class ... and so widely esteemed that there are more Picker "Century" 100 ma units actively in use than any other similar apparatus.

Picker x-ray

PICKER X-RAY CORPORATION
25 So. Broadway • White Plains, N. Y.

When writing please mention *Diseases of the Chest*

DISEASES *of the* CHEST

VOLUME XXIII APRIL 1953 NUMBER 4

Biopsy Techniques in the Diagnosis of Intrathoracic Lesions*

Including Lung Biopsy, Mediastinal Biopsy and Resection of the Deep Cervical Fat Pad and Its Contained Nodes Report of 12 Illustrative Cases

CLIFFORD F. STOREY, F.C.C.P., F.A.C.S., Captain (MC) USN† and
BENEDICT M. REYNOLDS, Lt. (jg) (MC) USNR
St. Albans, New York

Introduction

The purpose of this paper is to emphasize the value of certain infrequently employed biopsy techniques in the diagnosis of intrathoracic lesions. The methods to be discussed include *resection of the deep cervical fat pad and its contained nodes, mediastinal biopsy through an open thoracotomy* and *lung biopsy through an open thoracotomy*. None of these procedures represent original ideas of the authors. We feel, however, that the usefulness and safety of the techniques to be discussed have not been fully appreciated and that reiteration of their merits is warranted.

The concept that intelligent treatment demands an accurate diagnosis is universally accepted by the profession. It has been only in comparatively recent years, however, that this fundamental principle has been fully applied to intrathoracic lesions. In the past the policy of "watchful waiting" was frequently adopted, therapy was applied on the basis of a presumptive diagnosis, or trial and error methods were employed. Recent improvements in thoracic surgical techniques, in anesthesia, and in pre- and postoperative care have greatly increased the safety of thoracotomy and have made many previously invulnerable pathological processes within the chest fully susceptible to surgical attack. There have been simultaneous improvements in irradiation methods, and chemotherapeutic agents having at least some degree of effectiveness against certain chest lesions have become available. Paralleling these advances, there has been an increasing demand for, and critical need of, an accurate histological diagnosis in patients with intrathoracic masses. Although newly developed methods of exfoliative cyto-

*From the United States Naval Hospital, St. Albans, Long Island, New York.
†Chief of the Surgical Service and Head of the Department of Thoracic Surgery, United States Naval Hospital, St. Albans, Long Island, New York.
The opinions or assertions contained herein are those of the authors and are not to be considered as official or reflecting the views of the Navy Department or the naval service at large.

Copyright, 1953, by the American College of Chest Physicians

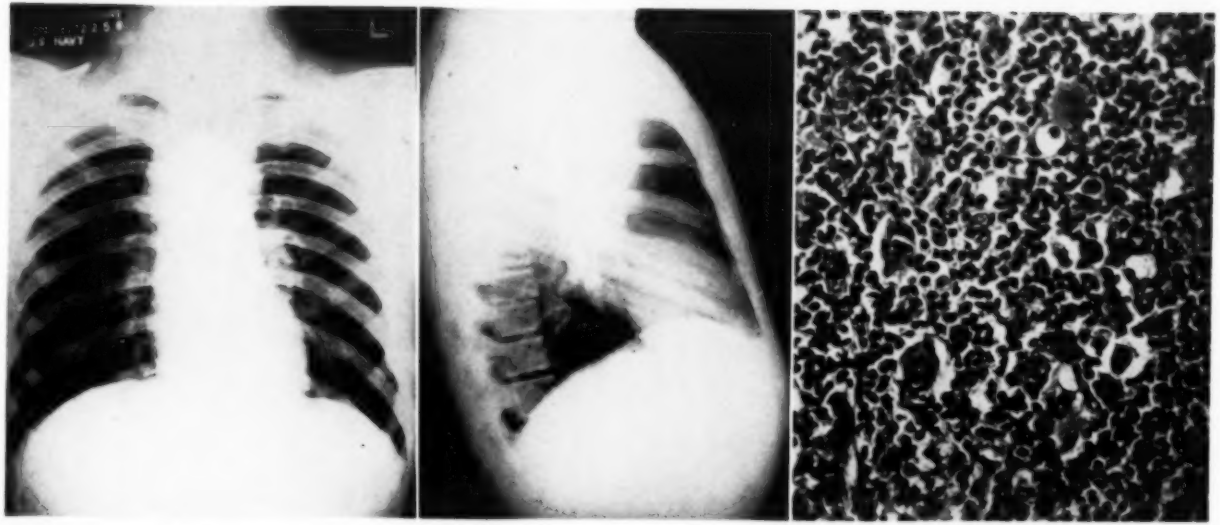


FIGURE 1a FIGURE 1b FIGURE 1c

Figure 1: (a) Posterior-anterior chest roentgenogram showing bilateral mediastinal mass.—(b) Right lateral chest film showing the central location of the masses.—(c) Photomicrograph of a node obtained on biopsy of the deep cervical fat pad which shows the characteristic appearance of Hodgkin's disease, granuloma type (X220).

logical study have contributed tremendously to the diagnosis of malignant lesions within the chest, direct biopsy remains the most certain means whereby a definitive diagnosis may be established.

It is not our purpose to discuss such proved biopsy methods as those carried out at bronchoscopy or esophagoscopy. Confirmatory lung or mediastinal biopsy of a unilateral lesion at the time of thoracotomy which has been undertaken with the intent of resecting the lung, lobe or mass in question will not be considered. These techniques are so widely accepted that they need no further advocacy. Biopsy through the thoracoscope has such a limited field of usefulness that it deserves no more than a word for the sake of completeness. We have not used punch or needle biopsy in recent years because of our conviction that the procedure is generally contraindicated in view of certain faults inherent to the technique and considering the risks which it entails. Needle biopsies of thoracic lesions are necessarily blind procedures. The tissue obtained is frequently inadequate and may be misleading. Histological interpretation often proves unusually difficult and demands the services of a pathologist particularly trained and skilled in the examination of tissue obtained by that means. The hazard of complications such as pneumothorax, hemothorax, and intrapulmonary hemorrhage is ever present. If the lesion is malignant the implantation of tumor cells along the needle track in the lung, pleura, chest wall, or skin is at least an unpleasant theoretical possibility. The implantation of tumor cells in the pulmonary vascular bed and lymphatics is certainly something to be feared and is a risk that we feel should be avoided if possible. The rapid dissemination of the visible dyes through the pulmonary lymphatics and to the regional mediastinal nodes has been well established.[1] It does not appear unreasonable to assume that liberated tumor cells could spread along the same route with comparable speed. The methods which we shall endeavor to emphasize, though not yet widely used, are felt to be relatively safe and to possess a high degree of usefulness.

Resection of the deep cervical fat pad and contained nodes. Among the procedures which offer much in the diagnosis of pulmonary and mediastinal lesions is the long used but little publicized method of resection of the deep cervical fat pad and the lymph nodes which lie within it. It is our impression that this useful technique has not received the widespread utilization which it merits in the investigation of intrathoracic pathology. Although used with great frequency in certain centers,[2] its value does not appear to have been fully recognized throughout the country and little has appeared in the literature concerning its usefulness. In addition to its value as a purely diagnostic measure, exploration of this region may be utilized in determining operability in pulmonary malignancy. In some clinics[2] this procedure has been adopted as a part of the study of patients with known or strongly suspected bronchogenic carcinoma of questionable resectability. If metastatic malignancy, compatible with a primary pulmonary lesion, is found in the deep cervical or superior mediastinal nodes upon resection of the deep cervical fat pad and its contained nodes, the case is usually judged inoperable. Although we have not adopted this policy

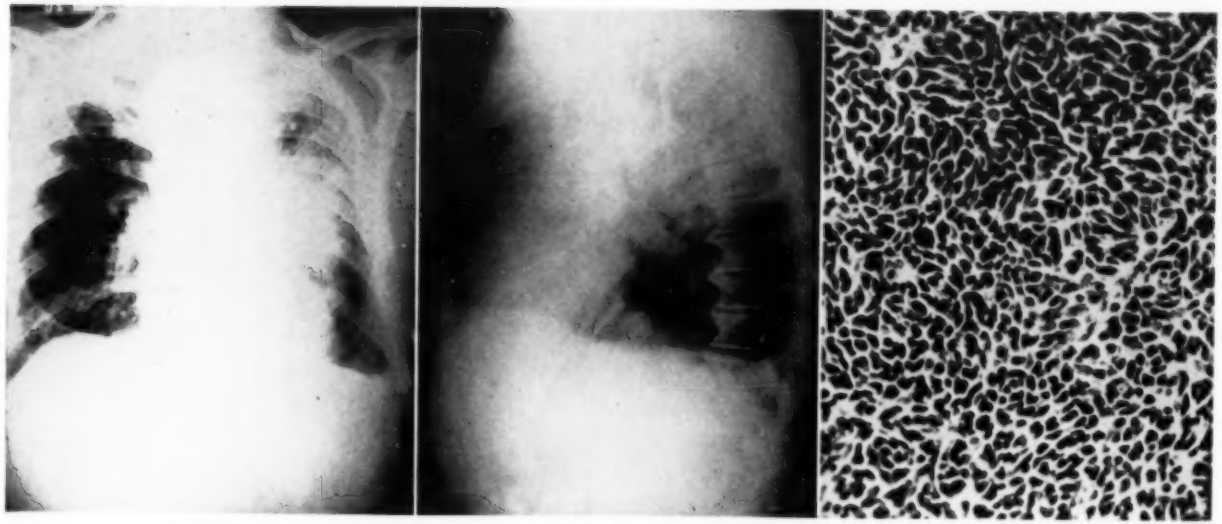


FIGURE 2a FIGURE 2b FIGURE 2c

Figure 2: (a) Posterior-anterior chest x-ray film showing a left hilar mass and marked widening of the superior mediastinum.—(b) Left lateral projection demonstrating the central position of the superior mediastinal mass.—(c) Photomicrograph of section from a lymph node obtained on biopsy of the deep cervical fat pad. The histologic diagnosis was anaplastic carcinoma, metastatic to lymph node, compatible with origin in a bronchus (X220).

and still frequently perform palliative resections in the presence of known widespread mediastinal metastases, careful follow-up studies may well show that the degree of palliation achieved by pulmonary resection when the nodes in the deep cervical fat pad are involved is not, in the usual case, sufficiently worthwhile to justify pneumonectomy. In any event the resectability rate under such conditions is low. It would certainly seem that in poor risk patients where the question of resectability is great, proved metastases in the deep cervical, subclavicular, or superior mediastinal nodes would weigh heavily against the decision to attempt extirpative surgery.

The operative technique has been adequately described by Daniels[3] and by Weiss and associates.[4] The approach differs in no important respect from that used for temporary paralysis of the phrenic nerve. Briefly the operation consists of an incision 2 or 3 centimeters in length in the supraclavicular fossa about one inch above the clavicle, the midpoint of the incision being centered between the external jugular vein and the lateral border of the clavicular head of the sternocleidomastoid muscle. The skin, subcutaneous tissues, platysma muscle and superficial layer of the deep cervical fascia are divided, bringing the deep cervical fat pad into view. This fat pad is excised, all fat and contained nodes down to the anterior scalene muscle and medially to the carotid sheath being freed. The dissection is then carried downward into the superior mediastinum along the great vessels and by traction on the fat pad from above a large mass of adipose tissue can be delivered into the neck from the subclavicular and retrosternal regions. This mass of fat will invariably contain nodes which may be quite large and easily recognizable or they may be so small that they can be detected only after careful search by the pathologist. The operation is done under local anesthesia, it requires only a few minutes and causes little or no discomfort to the patient. There is no morbidity after the procedure. The following cases illustrate the diagnostic information that may be obtained by employing this technique.

Case Reports

Case 1: F.J.T. This 17 year old white male was admitted to the U. S. Naval Hospital, St. Albans, New York, on January 2, 1951 following the discovery of a mediastinal mass on his 35 millimeter induction chest x-ray film taken on December 6, 1950. He was asymptomatic and physical examination revealed a few palpable lymph nodes in the axillary and inguinal regions which were discrete and only minimally enlarged. Posterior-anterior and lateral chest x-ray films (Figures 1a and 1b) confirmed the findings of a mass 7 x 9 centimeters in size situated in the anterior and mid-mediastinum. Laboratory studies showed a total white blood count of 16,500 with a normal differential. His hemoglobin level was 11 grams and he showed persistent hyperglobulinemia. The PPD test was negative in the first strength. Bronchoscopy showed a 50 per cent narrowing of both major bronchi. Papanicolaou smears of the bronchial aspirate and biopsy of the left main stem bronchus were negative. The patient's basal metabolic rate, angiocardiogram and sternal marrow were within normal limits. Left axillary lymph node biopsy on January 30, 1951 was reported as showing only chronic non-specific lymphadenitis. Deep cervical fat pad biopsy on March 6, 1951 was reported as showing *Hodgkin's disease* of lymph nodes, *granuloma type* (Figure 1c). X-ray therapy was instituted. After a total skin dose of 800 r units the bilateral medias-

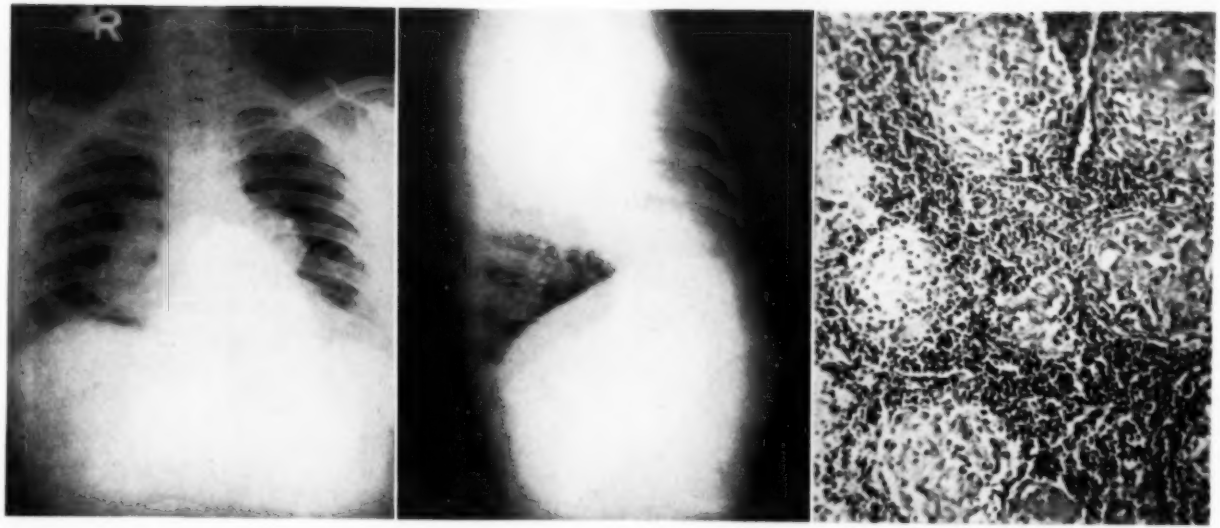


FIGURE 3a FIGURE 3b FIGURE 3c

Figure 3: (a) Posterior-anterior chest x-ray film showing large bilateral mediastinal masses. — (b) Right lateral view which shows that the masses are centrally located.—(c) Photomicrograph of section of a node obtained upon biopsy of the deep cervical fat pad. The histologic appearance is typical of Boeck's sarcoid (X100).

tinal mass had completely disappeared. He was discharged to home to be followed by monthly physical examination and chest x-ray films.

Comment: Peripheral lymph node biopsy in this case failed to establish the diagnosis. Had a trial of irradiation been used the diagnosis would have remained uncertain and the primary irradiation could not have been as accurately gauged. Advice as to future therapy would necessarily have been based on guesswork. Not even a general prognosis could have been offered with any feeling of security. The knowledge achieved as the result of a simple, harmless operative procedure in this case appears to have been well worthwhile.

Case 2: K.C. This 78 year old white male was admitted to the U. S. Naval Hospital, St. Albans, New York, on January 15, 1951 with a history of cough, chills and fever and right sided chest pain of one month's duration. His sputum was whitish in color and contained no blood. Physical examination revealed deviation of the trachea to the right, cardiac enlargement and auricular fibrillation. Chest x-ray films on admission showed a large area of consolidation about the upper and mid-portions of the left hilum with deviation of the trachea to the right (Figures 2a and 2b). The possibility of malignancy was strongly entertained.

Routine laboratory studies were within normal limits. Electrocardiograph showed ventricular fibrillation and typical right bundle branch block. A gastrointestinal series showed a small hiatus hernia. Barium enema demonstrated diverticulosis of the colon. Smear and culture of the sputum and bronchial aspirate were negative for acid fast bacilli and for neoplastic cells. Bronchoscopy showed fixation of the distal trachea. The left main stem bronchus was greatly narrowed. A bronchial biopsy was taken and reported negative for malignancy. A distinct bronchial lesion was not seen. The patient was digitalized with symptomatic improvement but serial x-ray films showed no change in the area of consolidation. On March 8, 1951 a deep cervical fat pad biopsy was performed and the specimen showed *anaplastic carcinoma*, metastatic to lymph node, compatible with primary bronchial origin (Figure 2c). The patient went rapidly down-hill and expired May 25, 1951. An autopsy was not obtained.

Comment: This patient, a sailor on the U.S.S. Maine when she was sunk in Havana harbor in 1898, had an age of record of 78 years. He appeared to be older. He had cardiac hypertrophy and right bundle branch block. He also suffered from auricular fibrillation. By any standard he was a poor surgical risk, particularly for an operation of the magnitude of radical pneumonectomy. Yet that operation would have been thoroughly justified had there been any real hope that a curative operation lay within the realms of reasonable possibility. We believe that the retrosternal biopsy, which showed metastatic carcinoma, saved this patient a futile operation of great magnitude which may well have shortened his life. It would almost certainly have offered little hope of appreciably increasing his longevity or his comfort. Cases such as this have impelled us to consider closely the philosophy adopted by Harken and his associates[2] to which we have previously referred. At the very least a positive retroclavicular biopsy informs the surgeon, with reasonable certainty, of the nature of the problem with which he is dealing. He may then act according to his own particular beliefs.

Case 3: G.W.M. This 27 year old man was admitted to the U. S. Naval Hospital, St. Albans, New York, on June 21, 1951. He was asymptomatic upon admission. His history revealed that a re-enlistment examination of June 1, 1951, including

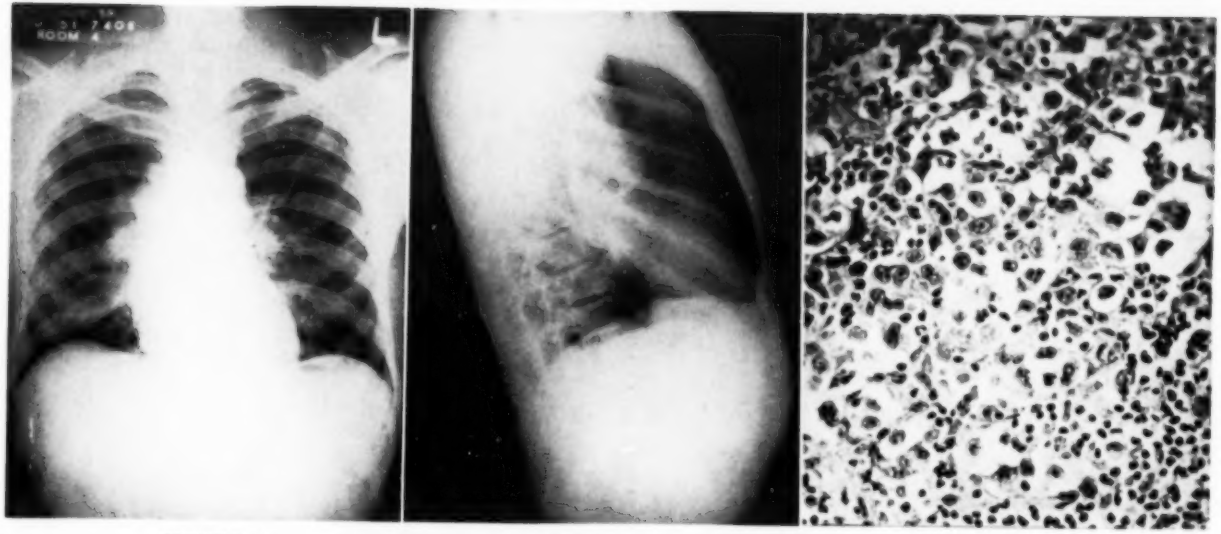


FIGURE 4a FIGURE 4b FIGURE 4c

Figure 4: (a) Posterior-anterior chest roentgenogram showing bilateral mediastinal masses. — (b) Right lateral film which shows that the masses are centrally placed.—(c) Photomicrograph of section of node obtained on biopsy of the deep cervical fat pad. The appearance is that of Hodgkin's lymphoma, granuloma type, of lymph nodes (X220).

chest x-ray films (Figures 3a and 3b), disclosed bilateral mediastinal masses not noted on a previous examination in June 1948. He had had vague gastrointestinal complaints for two months preceding his hospitalization. A complete gastrointestinal evaluation disclosed no abnormality and his symptoms subsequently subsided. His family history contained the information that his father had died from pulmonary tuberculosis.

His admission physical examination showed only mild exogenous obesity in an otherwise normal adult male.

A complete hemogram was normal. His initial urine specimen contained one plus albumin and many cellular elements. Subsequent urine studies were negative. The serum proteins and phosphatase studies were within normal limits. Stool studies were reported as negative. Hepatic and renal function were normal. His admission chest x-ray films revealed bilateral peribronchial lymph node enlargement and increased vascular lung markings consistent with Boeck's sarcoid. Intravenous pyelography was reported as normal. Chest x-ray films taken one month after admission disclosed a decrease in the size of the parahilar mass on the right side. A slight purulent discharge was noted at the right middle lobe bronchial orifice on bronchoscopy. This area was flushed with saline and aspirate studies were conducted for M. tuberculosis and for neoplastic cells by the Papanicolaou technique. The smears were negative for both mycobacterium tuberculosis and malignant cells. Circulation times and electrocardiograms were normal. The tuberculin test was negative. Protein bound iodine studies showed findings in the normal range. Deep cervical fat pad resection was done and the excised lymph nodes showed changes compatible with *Boeck's sarcoid* (Figure 3c).

Comment: The value of an accurate histological diagnosis in this case seems clear. Although Boeck's sarcoid is a disease of uncertain etiology and one whose behavior is largely unpredictable, it cannot be denied that such a diagnosis is reassuring in a case where one of the lymphoblastomas has been considered as a distinct possibility. This patient was not subjected to useless irradiation. Neither was he given a grave prognosis. Should he develop severe symptoms attributable to his mediastinal masses, which he did not have when under our care, ACTH or Cortisone could be given with reasonable assurance of at least temporary relief.

Case 4: J.D.H. was admitted to the sick list because a chest x-ray film examination showed bilateral mediastinal masses. He was asymptomatic on admission. Physical examination was negative. Further roentgen studies confirmed the presence of mediastinal masses (Figures 4a and 4b). An axillary lymph node biopsy on May 12, 1951 showed chronic lymphadenitis. Bronchoscopy on June 15, 1951 was normal; the aspirate was negative for acid fast bacilli. Electrocardiogram on May 29, 1951 was normal. Routine laboratory studies were within normal limits. The Kahn test was negative. Deep cervical fat pad biopsy on June 30, 1951 showed *Hodgkin's lymphoma, granuloma type*, of lymph nodes (Figure 4c). Radiation therapy was begun on July 2, 1951 and discontinued August 7, 1951. The patient received a total tumor dose of 2,945 r units. Three weeks later the mediastinal masses had almost completely disappeared. He remains asymptomatic.

Comment: The comments offered relative to Case 1, apply with equal force to this one. The value to the patient and to his physician of an accurate histological diagnosis seems evident.

Case 5: M.J.S. This 37 year old white man was admitted to the U. S. Naval Hospital, St. Albans, New York, on June 25, 1951 complaining of swelling of his head, face and neck which had first appeared one month previously. Upon admission he also complained of dyspnea and orthopnea. Shortly after entry, dizziness,

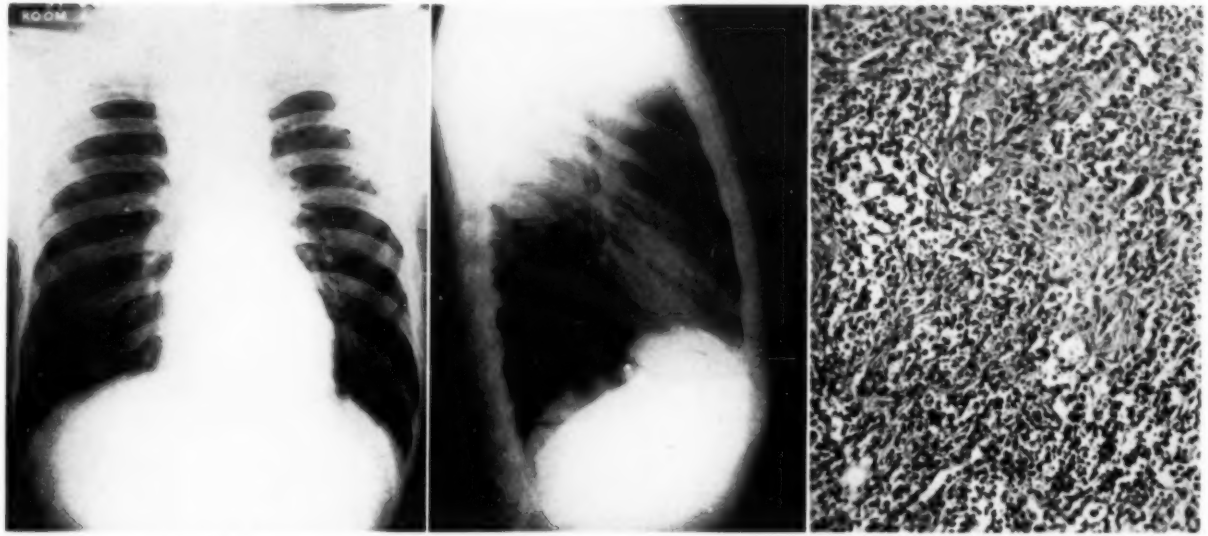


FIGURE 5a FIGURE 5b FIGURE 5c

Figure 5: (a) Posterior-anterior chest x-ray film showing bilateral superior mediastinal masses.—(b) Right lateral film shows the extensive involvement of the superior mediastinum. — (c) Photomicrograph of section of node obtained on biopsy of the deep cervical fat pad. The histologic diagnosis was Hodgkin's disease of lymph node showing irradiation effects (X100).

hoarseness, dysphagia and cyanosis were noted. Physical examination showed marked distention of the face and neck veins. He presented a moon-face, bull-like neck, and a dusky-ruddy complexion. Telangiectasis was present over the chest, shoulders, back and abdomen. Superficial venous distention was noted in the same areas. There was moderate exophthalmos. The neck was examined with difficulty due to the swelling but there appeared to be enlargement of the nodes in the anterior cervical chain. The blood pressure was 160/100 in the upper extremities. Fundoscopic examination disclosed retinal venous engorgement. The left testis was small and atrophic. The venous pressure was 500 mm. of water in the right arm and 440 mm. of water in the left arm. The circulation time (decholin—arm to tongue) was 60 seconds on the right and 48 seconds on the left. The remainder of the physical examination was within normal limits. Posterior-anterior and lateral chest roentgenograms (Figures 5a and 5b) showed a bilateral lobulated superior mediastinal mass extending from the thoracic inlet to the level of the bifurcation of the trachea. In the lateral view the mass was seen to be centrally located. Barium swallow showed a normal esophagus. An angiocardiogram disclosed findings consistent with superior vena caval obstruction and utilization of the azygos and hemi-azygos systems for return blood flow from the upper part of the body. Biopsy of a superficial supraclavicular lymph node showed only chronic nonspecific lymphadenitis on histologic study. Because of the patient's precarious condition, x-ray therapy was instituted. He received a total tumor dose of 3,100 r units. Regression of the mass and clinical improvement was prompt and striking. However, in order to obtain an accurate diagnosis, the deep cervical fat pad was excised on the left and subclavicular and retrosternal nodes thus obtained for histologic study. Histologic examination of the nodes showed findings compatible with *Hodgkin's disease* with irradiation effects (Figure 5c). This patient will be discharged from the service and advised to have periodic check-up examinations, including chest x-ray films, and further x-ray treatment when indicated.

Comment: The value of an accurate diagnosis in this case is obvious. A thoracotomy will not be done. Further treatment can be given with the assurance born of a precise knowledge of the nature of the lesion. The proper disposition of the case, as pertains to further military service, has been made apparent. In general terms, a prognosis of reasonable accuracy can now be offered.

Biopsy of a mediastinal mass using the open thoracotomy approach. A great variety of tumors, both benign and malignant, occur within the mediastinum. The malignant neoplasms may be primary in that site or metastatic from other regions, particularly from the lung (bronchogenic carcinoma). Finally, numerous non-neoplastic masses of abnormal nature are found in the mediastinum. Aneurysms of the heart and great vessels and diaphragmatic herniae are examples of the latter. Many of these masses, neoplastic and otherwise, will prove amenable to surgery. This is particularly true of those which are unilateral in distribution. Others will require radiation therapy or treatment with the newer chemotherapeutic agents. The group of lymphoblastomas provides the classic example of mediastinal masses which usually cannot be treated with success by surgical means. Rational therapy of neoplastic lesions obviously cannot be instituted without an accurate histological diagnosis. This implies the necessity for biopsy of the tumor mass. The results of a "trial of irradiation" are often equivocal. Malignant lesions which possibly could be

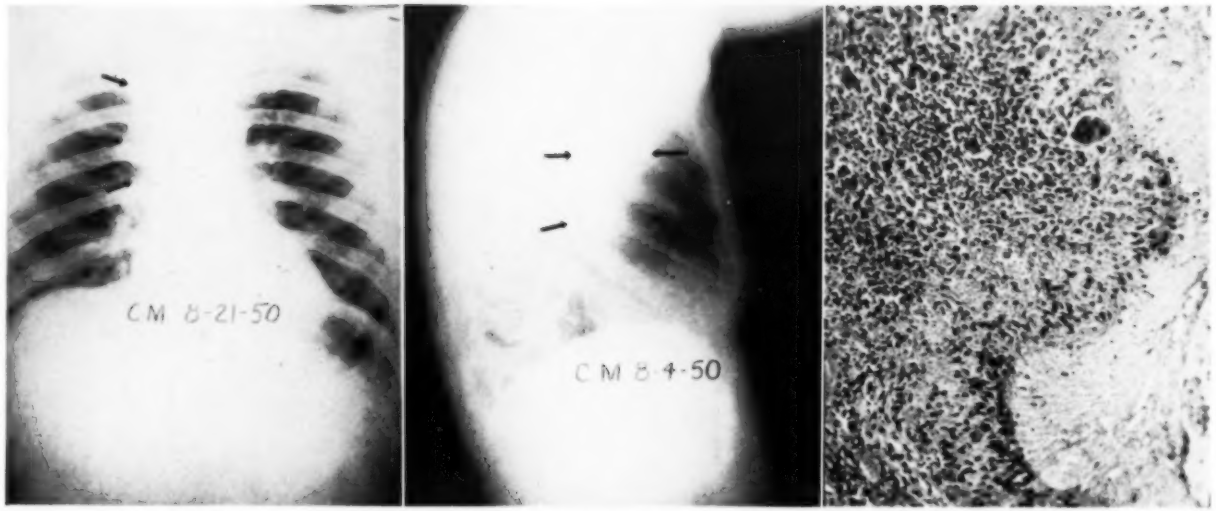


FIGURE 6a FIGURE 6b FIGURE 6c

Figure 6: (a) Posterior-anterior chest x-ray film showing large right paratracheal superior mediastinal mass. — (b) Right lateral chest x-ray film which demonstrates the central location of the mass.—(c) Photomicrograph of a section from the mass obtained at right superior mediastinal biopsy. The histologic appearance is consistent with mediastinal tuberculoma (X100).

successfully excised may, in certain instances, show an appreciable diminution in size after moderate radiation. Other masses, on the contrary, which cannot often be extirpated with success, such as certain types of Hodgkin's disease, may show almost no response to roentgentherapy in the usual test dosage (750 r units). Even though the tumor may show some degree of response, subsequent therapy cannot be accurately planned while the diagnosis remains in doubt. Neither can a prognosis be offered with confidence. In general, roentgenologists are loathe to undertake therapy unless the histological nature of the tumor to be irradiated has been definitely established. Surgeons are becoming less prone to agree to the employment of irradiation unless the tumor has been proved to be of a radiosensitive variety and shown to be one which cannot be excised. Only in extremely poor risk patients or those desperately ill have we hesitated to advise and carry out exploratory transthoracic mediastinotomy when the diagnosis of a lesion in that location remained uncertain after more simple diagnostic procedures had been exhausted. We have used a standard postero-lateral intercostal incision in most cases, for in our hands that approach provides the best and easiest access to all portions of the mediastinum. In an occasional case, where the lesion lay far anteriorly, we have used an anterior intercostal approach. The following cases illustrate the use of the procedure.

Case 6: C.M.* A colored male 30 years of age complained of pain in the right chest, shoulder and arm of one month's duration. He had dyspnea on exertion. Posterior-anterior chest films showed a lobulated area of hemogenous density in the right paratracheal region (Figure 6a). Lateral x-ray showed the mass to be centrally located (Figure 6b). Bronchoscopy showed distortion of the lower trachea and right main stem bronchus by extrinsic compression but no intrinsic lesion was seen. The tuberculin test was four plus in the first strength. Angiocardiography revealed complete obstruction of the left subclavian vein at its junction with the innominate. Other special studies were non-contributory. Right thoracotomy was performed on September 19, 1950. A large, densely adherent right paratracheal mass was found. Frozen section showed granulomatous inflammation. Partial resection was carried out but complete removal was technically impossible. The paraffin sections showed findings compatible with the diagnosis of *mediastinal tuberculoma* (Figure 6c). Smears from the necrotic center of the excised tissue were negative for acid fast bacilli on Ziehl-Neelsen stain.

The postoperative course was uncomplicated. The patient was maintained on a bed rest regimen and given a prolonged course of streptomycin and para-aminosalicylic acid. His lesion has shown marked regression. Repeat angiocardiograms made four months after operation showed complete relief of the subclavian vein obstruction. The patient is still under treatment.

Comment: There was rather strong presumptive evidence that this patient had a malignant mediastinal tumor. Lacking a precise histological diagnosis, a trial of irradiation would doubtless have been undertaken with ample justification and intensive irradiation would have been entirely defensible. The results of mediastinal biopsy emphasizes the error of such a program. Those findings indicated the proper therapeutic approach. The patient is well on the road to recovery and we have reason to anticipate a complete clinical cure. Pulaski and associates[5] have used exploratory

*This case was reported in detail in another publication.[11]

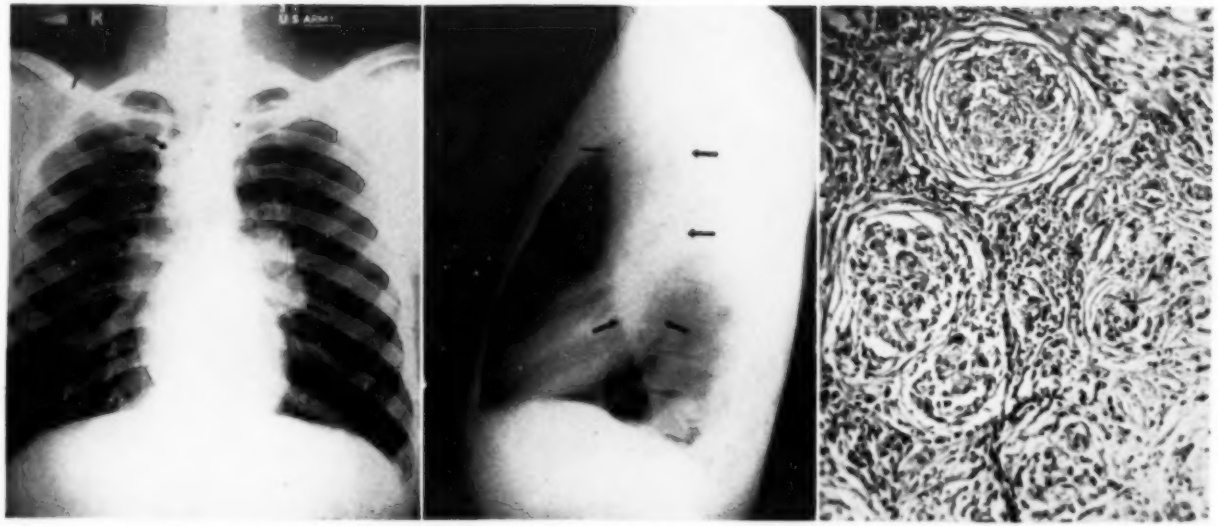


FIGURE 7a FIGURE 7b FIGURE 7c

Figure 7: (a) Posterior-anterior chest roentgenogram showing large bilateral mediastinal masses.—(b) Left lateral projection which shows that the masses are centrally located.—(c) Photomicrograph of section from a node obtained on right superior mediastinal biopsy. The histologic appearance is that of Boeck's sarcoid (X100).

mediastinotomy in the investigation of undiagnosed mediastinal masses which proved on histological study to represent tuberculous lymph nodes. Their patients, who were placed on a therapeutic regimen similar to that employed in the case just described, showed comparable clinical responses.

Case 7: P.F.G. A 21 year old white man was hospitalized because of a marked bilateral mediastinal lymphadenopathy which was discovered on routine chest roentgenograms (Figures 7a and 7b). He complained of moderate weakness and slight dyspnea on exertion. Physical examination was negative. There was no peripheral adenopathy. The tuberculin test was three plus in the first strength. Studies for acid fast bacilli were negative. Bone marrow studies were normal. Peripheral blood was normal. A roentgenographic bone survey showed a small area in a metacarpal bone and another in the skull suggestive of osteolytic lesions. A "trial of irradiation" consisting of a total skin dose of 750 r units was given over a sharply localized, small, well shielded field centering over the largest of the mediastinal masses on the right. One month later the same mass showed no regression.

Right thoracotomy was performed on September 28, 1950. Many greatly enlarged succulent discrete nodes were found extending in a chain from the thoracic inlet to the diaphragm. That group lying above the right hilum and along the right side of the trachea was removed for microscopic study. The histologic diagnosis was *Boeck's sarcoid* (Figure 7c).

The postoperative course was uncomplicated. When his wound had healed he was granted 30 days convalescent leave. Chest x-ray films upon his return showed striking regression of all lesions, including those on the left as well as those on the operated side. Although he was symptom free, the patient was discharged from the military service because of the uncertain course of his disease.

Comment: This patient with an undiagnosed mediastinal lesion, lobulated in appearance and presenting bilaterally, was given a test dose of x-ray prior to his transfer to the thoracic surgery service. There was no diminution in the size of the irradiated mass following that therapy. It was therefore correctly concluded that he did not have a highly radiosensitive tumor, specifically, that his mediastinal masses probably did not represent one of the lymphoblastoma group. The correct diagnosis was established by mediastinal biopsy. One can scarcely fail to conjecture, however, as to the subsequent management of this case had the mediastinal x-ray therapy been given over a large field and had the regression of the lesions, which took place spontaneously several weeks later, followed shortly after irradiation. Fallacious conclusions as to the probable nature of the patient's disorder would have been almost inevitable. It is to be particularly noted that the lesions which showed the striking diminution in size had not been irradiated. The masses in the area which had been treated by x-ray had been surgically excised when they proved to be non-radiosensitive. This case dramatically illustrates, in our opinion, the possibility of an erroneous diagnosis that exists when the diagnosis is based on the response to irradiation rather than on histological evidence. Such an error could lead to useless irradiation and would almost certainly prompt a prognosis which would very probably prove to be grossly inaccurate.

Case 8: B.B.C. This 25 year old patient entered the hospital because of precordial pain, shortness of breath, and palpitation developing after strenuous exertion. Previous to this episode there were occasional sharp pains localized in the pre-

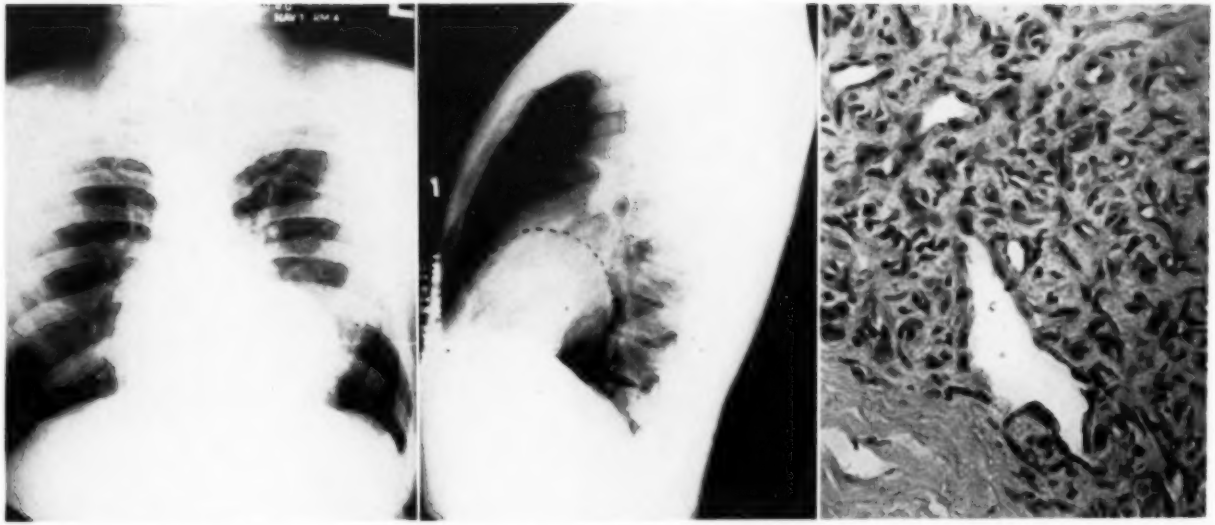


FIGURE 8a FIGURE 8b FIGURE 8c

Figure 8: (a) Posterior-anterior chest x-ray film showing a large mass projecting from the left border of the heart.—(b) Left lateral view which shows that the mass lies in the middle mediastinum.—(c) Photomicrograph of section of tissue obtained on biopsy of a cardiac tumor mass. The histologic diagnosis was "sclerosing hemangioma" (X220).

cordial region. These symptoms subsided in 24 hours. An electrocardiogram showed changes suggestive of an anterolateral wall coronary infarction but ballistocardiograms on four occasions were completely normal. Chest roentgenogram (Figure 8a) showed a rounded area of increased density, regular in contour, projecting to the left from the left border of the heart. In the lateral view (Figure 8b) this mass was again seen as an almost perfectly spherical shadow of increased density overlying the cardiac silhouette. In this view it measured 9.3 cms. in diameter. At the anterior cardiophrenic angle the mass reached the chest wall and posteriorly it extended about 3 cms. beyond the shadow of the heart. The mass showed apparent paradoxical motion on fluoroscopy. It exhibited transmitted but not expansile pulsation. The esophageal contour was normal on barium swallow. Bronchoscopy was negative. Studies of the sputum for acid fast bacilli and of the bronchial aspirate for neoplastic cells were negative. Angiocardiography was performed on two occasions. In neither instance did the mass opacify. Left thoracotomy and pericardiotomy was performed on November 29, 1949. A large, very firm spherical mass the size of a small grapefruit was seen occupying the wall of the left ventricle. In some areas the mass was smooth, white and glistening while in others there was rough tissue appearing somewhat like granulation tissue. Exploratory needle aspiration showed the mass to be uniformly firm and dense. Nothing was obtained upon attempt at aspiration. Two biopsies were taken. The mass bled freely from the biopsy sites. The histological diagnosis was *sclerosing hemangioma* (Figure 8c).

Comment: Preoperatively the possibility of the mass in this patient representing a left ventricular aneurysm, filled with organized clot, was strongly entertained. A teratoid tumor and pericardial coelomic cyst were among other possibilities considered. An accurate diagnosis was most important from the standpoint of therapy and in order to advise the patient intelligently. He has been allowed to return to his occupation as a truck driver. Periodic chest x-ray films over a period of more than two years have shown no change whatsoever in the size or contour of his mass. The patient is entirely free of symptoms.

Lung biopsy using the open thoracotomy approach. The justification for the early employment of exploratory thoracotomy in the presence of undiagnosed unilateral solid pulmonary infiltrates suspected of being neoplastic has been firmly established. Operation under those circumstances has been widely adopted by thoracic surgeons.[6] Many authors, most recently Overholt,[7] have strongly advocated early exploratory thoracotomy in the management of so-called "silent" unilateral localized pulmonary lesions. The utilization of lung biopsy for the diagnosis of diffuse pulmonary lesions, especially those of bilateral distribution, has achieved much less popularity. No one can dispute the fact that vigorous efforts should be made to arrive at a diagnosis without, or prior to, surgery in these cases. The attending physician must be particularly alert to prove or disprove, if possible, the presence of pulmonary tuberculosis. Efforts along these lines frequently fail, however. For both prognostic and therapeutic reasons an accurate diagnosis is so important that we advocate direct lung biopsy in such a situation. An intercostal incision has been employed in carrying out lung biopsy. The incision is placed over the most dense portion of the mass, or, where serial films have shown its development and spread. We have chosen to obtain the biopsy from or near the site of origin. Thus an



FIGURE 9a FIGURE 9b FIGURE 9c

Figure 9: (a) Posterior-anterior chest x-ray film showing diffuse bilateral pulmonary lesions. — (b) Right lateral projection which shows the principal involvement to be in the apical and posterior portions of the lungs. — (c) Photomicrograph of section of pulmonary parenchyma obtained at biopsy of the superior segment of the right lower lobe. The histologic appearance is that of sarcoidosis (X220).

anterior, lateral or posterolateral incision has been used as dictated by the situation in the individual case. The procedure is not an unduly time consuming or shocking one and is well tolerated even by patients in poor general condition. Their convalescence from the operation has been rapid, morbidity has been almost none and there has been no mortality. We have not yet employed the approach suggested by Klassen.[8] His technique appeals to our imagination, however, because of its apparent speed, safety and simplicity. We propose to give the method a trial when next presented with the type of case where its use is recommended by the originator, namely, a diffuse symmetrical bilateral pulmonary infiltration which has defied diagnosis by means short of biopsy. The following cases demonstrate the use and value of direct lung biopsy in the study of diffuse bilateral pulmonary lesions.

Case 9: C.C.C. This 25 year old white male was transferred to the U. S. Naval Hospital, St. Albans, New York, on October 3, 1950 complaining of vague chest pain and a 20 pound weight loss. Physical examination was essentially negative. Chest x-ray film revealed extensive bilateral upper lobe infiltration. Past history revealed that he had had a negative chest roentgenogram on June 18, 1948. The patient had been hospitalized on October 3, 1949 because of findings of a right upper lobe infiltration. Complete work-up was negative at that time and he was discharged to duty with the diagnosis of *Pulmonary Fibrosis*, cause undetermined.

He was re-admitted to the hospital one month later for further study and had been continuously on the sick list since that time. Sixteen monthly smears and cultures of the sputum and several of the bronchial aspirate were negative for mycobacterium tuberculosis. The PPD skin test was three plus in the second strength. Histoplasmin and coccidioidin skin test were negative. Routine blood studies, including the erhythrocyte sedimentation rate, were within normal limits. Skeletal survey, including x-ray films of the hands and feet, was negative. Bronchoscopy revealed nothing significant. The patient continued to have a low grade elevation in temperature and mild chest pain. He was given a prolonged course of para-amino salicylic acid and streptomycin with no discernible improvement. Chest roentgenograms (Figures 9a and 9b), in fact, showed an increase of his lesions while receiving that therapy.

On May 1, 1951, through a right thoracotomy incision, a wedge resection of a portion of the superior segment of the right lower lobe was performed. The lung was found to be filled throughout with nodular infiltrations of varied size. The upper lobe was found adherent to the mediastinum and thoracic wall and there were pleural adhesions posteriorly over the superior segment of the lower lobe. The patient's postoperative course was benign. The pathological report was chronic granulomatous inflammation of lung, probably *sarcoidosis* (Figure 9c). Sarcoidosis was suggested by the well formed tubercles, fibrous tissue, absent caseation and bizarre giant cells. Smears and cultures of the biopsy specimen were negative for acid fast bacilli.

Comment: This patient had been hospitalized for 16 months with the diagnosis of pulmonary tuberculosis and had been continuously under treatment for that disease while on the sick list. Repeated and intensive efforts to obtain bacteriological verification of the clinical diagnosis had failed. His lesions increased while under streptomycin therapy. When admitted to the thoracic surgical service the patient's apparent state of health was by no means that to be expected from the appearance of his chest roentgenograms. He was afebrile, he had no cough or expectoration,



FIGURE 10a FIGURE 10b FIGURE 10c

Figure 10: (a) Posterior-anterior chest roentgenogram showing widespread, diffuse bilateral pulmonary lesions.—(b) This left lateral view also demonstrates the diffuse involvement. — (c) Photomicrograph of section from tissue obtained at biopsy of the lingula. The histologic diagnosis was eosinophilic granuloma of lung (X100).

his nutritional status was excellent and he was gaining weight. In short, he looked and felt well. Although the future of patients with sarcoidosis is difficult to forecast accurately, the importance to this patient of knowing that he does not have tuberculosis is apparent. He can now be discharged from the sanitorium. Cortisone or ACTH can be safely employed if desired.

Case 10: P.Y.* This 42 year old white male was admitted November 15, 1949 with a history of a "cold" of one month's duration and a dry non-productive cough for two weeks prior to admission, associated with a 20 pound weight loss and marked fatigue. His past history revealed exposure to asbestos for seven years preceding entry to the hospital. Physical examination revealed a diminution of breath sounds bilaterally throughout the lower one-half of the lung fields. There were no rales. Chest x-ray films (Figures 10a and 10b) on admission showed evidence of bilateral discrete parenchymal infiltration in both lungs, more prominent in the region of the mid-lung zone. There was no definite evidence of cavitation. The admission diagnosis was probable bilateral *pulmonary tuberculosis*.

Routine work-up showed moderate anemia. The tuberculin reaction was positive in the second strength. Sputum studies by smear and culture were negative for acid fast bacilli. No asbestos bodies were found and cultures of the sputum for fungi revealed only monilia. Bronchoscopy showed mucopurulent secretions in the bronchial tree. Smear and culture of the aspirate were negative for fungi and acid fast bacilli. Papanicolaou cellular studies were negative for neoplasia. Gastrointestinal series, barium enema, electrocardiogram and respiratory function studies were within normal limits. The patient continued to have a low grade elevation of temperature.

On January 16, 1950 a lung biopsy from the lingular division of the left upper lobe was done through a left lateral thoracotomy incision. Histologic studies showed focal chronic granulomatous inflammation of the lung with marked eosinophilic reaction; etiology undetermined* (Figure 10c). The microscopic appearance of the lesions bore a strong resemblance to that seen in eosinophilic granuloma of bone. Histologically, also, this case resembled *Loeffler's disease* of the lung but clinically it differed in that the lesions in Loeffler's syndrome are characteristically fleeting and migratory. Similar cases, also proved by lung biopsy, have been reported by Farinacci and associates.[9] The patient's postoperative course was benign. He was discharged to home February 4, 1950. Since that time he has been followed in the Out-patient Department and his chest x-ray films have shown steady regression of the pulmonary lesions. At the present time his chest roentgenograms present an essentially normal appearance. He is working full time and is entirely free of symptoms.

Comment: In this case also the diagnosis of pulmonary tuberculosis was strongly considered. The entire management of the case, not to mention the prognosis, was radically altered as a result of the diagnosis established by lung biopsy.

Case 11: J.H. This 24 year old white male was admitted to the sick list September 23, 1950 because a routine chest film on recall to active duty revealed a nodular density far laterally at the level of the right third anterior interspace. For three months the patient had had right subscapular pain and for one month a dry cough. Physical examination was essentially negative. Routine laboratory studies were within normal limits. Review of his chest x-ray film dated June 21,

*Note: Detailed histologic studies of this case, with others of similar type, are to be reported in detail in another publication by the Department of Pathology of this hospital.

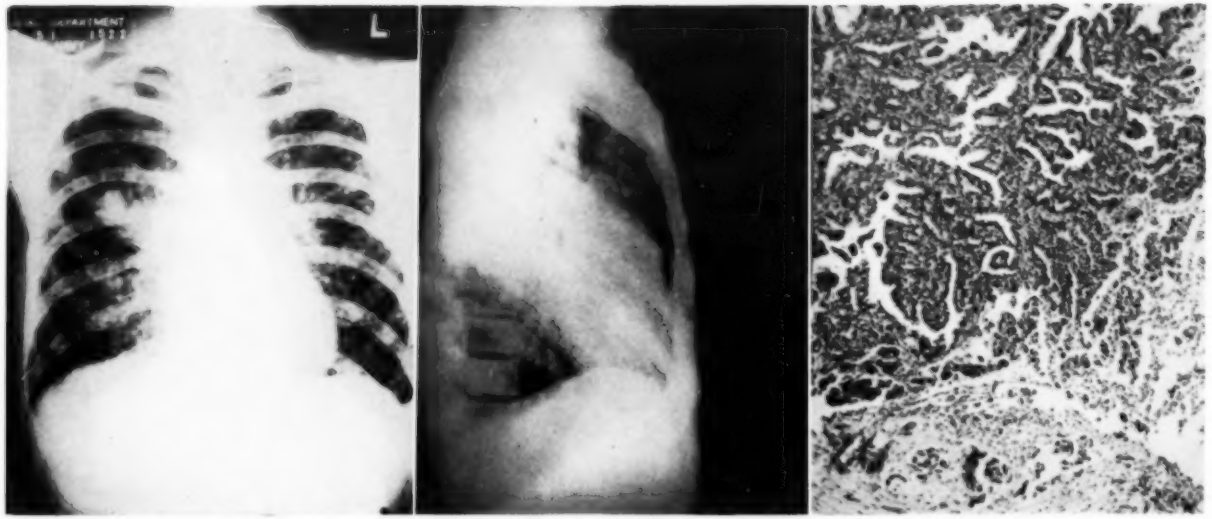


FIGURE 11a FIGURE 11b FIGURE 11c

Figure 11: (a) Posterior-anterior chest x-ray film showing widespread, diffuse bilateral pulmonary infiltrations.—(b) This right lateral film also demonstrates the extensive distribution of the lesions. — (c) Photomicrograph of section from tissue obtained at biopsy of the anterior segment of the right upper lobe. The histologic diagnosis was terminal bronchiolar (alveolar cell) carcinoma (X100).

1949, taken prior to recall to active duty, showed a similar lesion. This film had been interpreted as negative. The diagnosis of *pulmonary tuberculosis* was made on clinical evidence. All sputum and gastric washings were negative for acid fast bacilli. A PPD skin test was positive in the first strength. The histoplasmin and coccidioidin tests were negative. Bronchoscopy was negative. The bronchial aspirate showed no neoplastic cells. The patient's course in the hospital was febrile with roentgen studies showing a diffuse spread of the disease, compatible with hematogenous tuberculosis. They also indicated the development of a pericardial effusion (Figures 11a and 11b). He was placed on streptomycin and para-aminosalicylic acid with no improvement. Pericardiocentesis on two occasions produced 500 and 800 cubic centimeters of frankly bloody fluid which contained abnormal cells of indeterminate type. The slides were reviewed by Dr. Papanicolaou who considered them suspicious of malignancy (Class III).[9] No primary site could be found. Muscle and peripheral lymph node biopsies were negative. A lung biopsy was performed on January 27, 1951. The specimen was obtained from the original lesion in the anterior segment of the right upper lobe. Histologic study showed a *terminal bronchiolar* or *alveolar cell carcinoma* of the lung (Figure 11c). Although the patient was in very poor general condition at the time of thoracotomy, he withstood the procedure well and it did not appear to produce any demonstrable deleterious effects. His subsequent course was progressively downhill until his death on March 16, 1951. Autopsy showed extensive bilateral bronchiolar carcinoma with widespread metastases.

Comment: Again in this case a diagnosis of pulmonary tuberculosis was made on the basis of clinical evidence without bacteriological proof. The patient was placed on an antituberculosis regimen but failed to respond. Since many features of his disease did not appear characteristic of tuberculosis, lung biopsy appeared to be justified in order to establish an accurate diagnosis. Unfortunately, the presence of a condition for which no effective treatment is available was verified. However, this scarcely can be used as an argument against the biopsy technique employed nor can it be said to negate the value of the procedure.

Case 12: C.G.S. This 29 year old white male was well until April 1949, when he developed jaundice associated with back pain and anorexia. Due to the persistent signs of biliary obstruction an exploratory laporatomy was performed in May 1949 and a questionable mass was felt at the distal end of the common duct. A cholecystectomy was performed with T-tube drainage of the common duct. In December 1949 the patient had a similar episode. Studies showed moderate liver parenchymal disease with intermittent obstruction. A routine chest roentgenogram on February 2, 1950 revealed a left lower lobe infiltrate. PPD, histoplasmin and coccidioidin skin tests were negative. Repeated smears and cultures were negative for acid fast bacilli and fungi. On May 18, 1950 another exploratory laporatomy was performed with the finding of an obstruction in the common duct, thought to be due to a stone. The choledochus was dilated and T-tube drainage again instituted. Serial chest x-ray films revealed a spread of the original pulmonary lesion to involve the entire left lower lobe with multiple infiltrations throughout both lower lung fields (Figures 12a and 12b). Bronchoscopy was normal. Papanicolaou stains of the bronchial aspirate was reported as suspicious of malignant change. On May 7, 1951 a lung biopsy was performed with wedge excision of a portion of the anterior segment of the left lower lobe. At operation the entire lower lobe was found to be consolidated and of liver-like consistency. Smaller areas of similar involvement were present in the upper lobe. A slimy mucoid material exuded from the cut surface of the lung. There were no air leaks when the biopsy was taken, for the pulmonary parenchyma had been totally invaded by what proved to be car-



FIGURE 12a FIGURE 12b FIGURE 12c

Figure 12: (a) Posterior-anterior chest x-ray film showing extensive lesions in both lower lung fields.—(b) Left lateral view which shows that both the upper and lower lobes are involved. (At operation there was no free fluid in the left pleural space. The left lower lobe was almost completely replaced by a solid tumor). — (c) Photomicrograph of section from tissue obtained at biopsy of the left lower lobe. The histologic diagnosis was mucoid carcinoma, compatible with primary bronchiolar carcinoma of the lung or metastases from a primary malignancy of the bowel (X220).

cinoma. Histologic examination (Figure 12c) showed the lesion to be a mucoid carcinoma, most likely a *terminal bronchiolar* or *alveolar-cell carcinoma*, although metastasis from a primary in the gastrointestinal tract could not be definitely excluded. Thoracotomy was well tolerated by this chronically ill patient. His postoperative course was benign. However, his general condition continued to deteriorate slowly. Repeat x-ray film studies of the large and small bowel and upper gastrointestinal tract were again negative. The patient has been discharged to home for terminal care. The prognosis is judged hopeless. Although still alive at this writing (August 26, 1951), a recent follow-up letter from his family states that his downhill course continues. This patient has since died. Postmortem examination showed a primary mucinous adeno-carcinoma of the pancreas. The pulmonary lesions were metastatic.

Comment: Although lung biopsy did not conclusively establish the site of origin of the tumor, the procedure did essentially clarify the diagnosis, enable a prognosis to be offered, and point to a rational plan of management of the case. It is again unfortunate that the lesion found in this case was not one amenable to therapy, but the pulmonary lesions could have been inflammatory and multiple infarcts was another one of the possibilities considered preoperatively. The fact that a lesion which could not be successfully treated was found at lung biopsy certainly lessened, but by no means destroyed, the usefulness of an accurate histologic diagnosis.

SUMMARY

1) Ideal therapy of intrathoracic lesions cannot be undertaken without an accurate histological diagnosis.

2) The role of bronchoscopic and esophagoscopic biopsy in the investigation of thoracic lesions has long been firmly established and the necessity for early exploratory thoracotomy in the management of undiagnosed unilateral solid pulmonary infiltrates suspected of representing bronchogenic carcinoma has been widely accepted in recent years.

3) There are other biopsy techniques available for the study of intrathoracic disease that do not appear to have been generally utilized. These include: (a) Resection of the deep cervical fat pad and its contained nodes, (b) mediastinal biopsy at open thoracotomy and (c) lung biopsy at open thoracotomy. We have used each of these methods in an appreciable series of cases and in practically every instance it has been possible to establish a definite histological diagnosis. The procedures have occasioned minimal morbidity and no mortality. They appear to merit more widespread use in the investigation of chest lesions posing difficult diagnostic problems.

4) Cases are reported to illustrate the use of each of the three foregoing methods.

RESUMEN

1) No puede emprenderse el tratamiento ideal de las lesiones intratorácicas sin un diagnóstico histológico exacto.

2) El papel de la biopsia broncoscópica y esofacoscópica de las lesiones torácicas ha sido firmemente establecido hace tiempo y la necesidad de la exploración por toracotomía temprana en el diagnóstico y tratamiento de los infiltrados unilaterales sólidos sospechosos de carcinoma bronquigénico ha sido ampliamente aceptado en los años recientes.

3) Hay otras técnicas para el estudio de las enfermedades intratorácicas, cuyo uso no parece haberse generalizado. Tales incluyen: (a) resección de la grasa profunda cervical y de sus ganglios incluidos, (b) biopsia mediástinica durante la toracotomía, y (c) biopsia del pulmón por la toracotomía a cielo abierto. Hemos usado cada uno de estos métodos en una serie apreciable de casos y prácticamente en cada caso ha sido posible establecer un diagnóstico histológico definido. El procedimiento tiene una morbilidad ocasional mínima y ninguna mortalidad. Estos procedimientos merecen mas difusión en su uso para la investigación de las lesiones del torax que presentan dificultad para el diagnóstico.

4) Se presentan casos que ilustran cada uno de los tres métodos.

RESUME

1) Le traitement idéal des lésions intra-thoraciques ne peut être entrepris sans un diagnostic histologique préalable.

2) Le rôle de la biopsie bronchoscopique et oesophagoscopique dans le diagnostic des lésions thoraciques est solidement établi. De même, on a largement accepté ces dernières années la nécessité d'une thoracotomie exploratrice précoce pour préciser la nature d'infiltrats pulmonaires denses unilatéraux, suspects de représenter un cancer bronchique.

3) Il existe d'autres techniques de biopsie pour l'étude des affections intrathoraciques que ne semblent pas avoir été utilisées de façon générale. Elles comprennent: (a) la résection du ganglion cervical et des nodules qu'il contient, (b) la biopsie médiastinale après thoracotomie large, (c) la biopsie pulmonaire après thoracotomie large. Nous avons utilisé chacune de ces métodes pour un nombre appréciable de cas, et pratiquement pour chacun d'eux il à été possible d'établir un diagnostic histologique précis. Ces techniques n'ont causé qu'une faible morbidité et pas de mortalité. Elles semblent mériter de se généraliser dans la recherche des lésions pulmonaires posant des problèmes diagnostiques difficiles.

4) Les auteurs rapportent des cas illustrant chacune de ces trois méthodes.

REFERENCES

1 Weinberg, Joseph A.: "Identification of Regional Lymph Nodes in the Treatment of Bronchogenic Carcinoma," *J. Thoracic Surg.*, 22:517, 1951.
2 Harken, Dwight E., discussion of "A Preliminary Report of 26 Cases of Pulmonary Resection with Pleurectomy," Cotton, Bert H. and Penido, John R. F., *J. Thoracic Surg.*, 22:474, 1951.
3 Daniels, A. C.: "A Method of Biopsy Useful in Diagnosing Certain Intrathoracic Diseases," *Dis. of Chest*, 16:360, 1949.
4 Weiss, H. A., Campbell, R. M. and Budenz, G. C.: "Sarcoidosis Diagnosed by Means of Subclavian Lymph Node Biopsy: Report of a Case," *J.A.M.A.*, 146: 1221, 1951.
5 Pulaski, Edwin J., Connell, James F. Jr. and Seeley, Sam F.: "Streptomycin in Surgical Infections: VII. Nonpulmonary Tuberculosis (Lymph Nodes, Urinary Tract, Bone, and Peritoneum)," *Annals of Surg.*, 129:90, 1949.
6 Husfeldt, E. and Carlsen, C. J.: "Diagnostic Thoracotomy for Solid Pulmonary Infiltrates," *Thorax*, 5:229, 1950.
7 Overholt, Richard H.: "The Value of Exploration in Silent Lung Disease," *Dis. of Chest*, 20:111, 1951.
8 Klassen, K. P., Anlyn, A. J. and Curtis, G. M.: "Biopsy of Diffuse Pulmonary Lesions," *Arch. Surg.*, 59:694, 1949.
9 Farinacci, C. J., Jeffrey, H. C. and Lackey, R. W.: "Eosinophilic Granuloma of the Lung: Report of Two Cases," *U. S. Armed Forces Med. J.*, 2:1085, 1951.
10 Papanicolaou, George N.: Personal communication.
11 Storey, C. F. and Lyons, H. A.: "Tuberculomas of the Mediastinum," *Am. Rev. Tuberc.*, 64:327, 1951.

Detection of Cardiac Abnormalities by Mass Chest X-Ray Surveys

G. HOWARD GOWEN, M.D.
Springfield, Illinois

Of the various types of suspected chest pathology found in 70 mm. x-ray films taken during mass surveys cardiac enlargement is quite common. In order to determine if possible the significance and value of such findings a follow-up study was made of cases of cardiac enlargement detected as a result of chest x-ray surveys conducted by our Bureau of Tuberculosis Control from March 1950 to March 1951.

During this period 154,111 chest photofluorograms were taken. There were in this group 55,601 people 45 years of age and over. The number of cases in which cardiac abnormality was suspected was 515. Questionnaires were sent to the personal physician of each of the 515 cardiac suspects. The final diagnosis was requested and in those cases diagnosed as having cardiac disease the physician was also asked if he had been previously aware of the condition.

In answer to the 515 questionnaires there were 257 complete replies or about 50 per cent return. Of these 13 were diagnosed as not having cardiac pathology leaving a total of 244 or approximately 95 per cent in which definite abnormality existed. Table I shows the various diagnoses reported on the 244 cases proved to have some deviation from normal.

It is interesting to note in Table I that there were five instances in which dexiocardia existed. Apparently this condition is not at all uncommon. The ages of these five individuals were 23, 33, 39, 46 and 73. There were three females and two males. The reports indicated that no pathology was coexistent with the dexiocardia. The wide age span from 23 to 73 years suggests that dexiocardia has no adverse influence on longevity.

As would be expected, 88 per cent of the cardiac abnormalities were found in the age group 45 years and over although this age group accounted for only about 36 per cent of the chest photofluorograms taken. In order to show the variation in incidence of the types of heart abnormality according to different ages, Table I has been broken down into three sub-groups as shown in Tables II, III and IV. The pattern would seem to be quite the usual one with rheumatic heart disease predominating in the age group under 45 and the various other types of heart disease becoming increasingly in evidence with advancing years.

One item in the questionnaire asked for information about the weight status of the patient. The percentage of cases of overweight in relation to the type of diagnosis is given in Table V. The high per cent of overweight among patients diagnosed as having hypertensive heart disease is significant if not unexpected. From the point of view of longevity and productive ability, this group of patients would much better have been the group with the smallest per cent of overweight. Apparently the establishment of an

acceptable weight limit was not part of the therapeutic regimen of many of these individuals. To give some idea of the degree of overweight among the hypertensive heart disease cases a few examples will be presented. In six instances in which the amount of overweight was reported in pounds the weight excesses were 20, 25, 30, 50, 60 and 50 to 70 pounds. In three other individuals the respective weights were 222, 260 and 270 pounds. In 33 cases the data was reported in terms of per cent of overweight. This information is given in Table VI. Reverting again to Table V it is seen that 43 per cent of the cases of cardiac abnormality reported to us were overweight to some degree. Also these data show that almost half of the total cases of overweight are associated with the category hypertensive heart disease.

Another type of information obtained in the questionnaire relates to whether the cardiac condition present was already known by the patient's personal physician or whether through the x-ray survey pathology was

TABLE I

DIAGNOSES REPORTED IN 244 COMPLETE QUESTIONNAIRES RETURNED ON CARDIAC SUSPECTS

DIAGNOSIS	Number of Cases	Per cent
Hypertensive Heart Disease	75	30.7
Rheumatic Heart Disease	49	20.1
Degeneration of Myocardium	41	16.8
Arteriosclerotic Heart Disease with Hypertension	26	10.7
Arteriosclerotic Heart Disease without Hypertension	16	6.6
Coronary Heart Disease	14	5.7
Cardiac Enlargement Cause Undetermined	12	4.9
Miscellaneous	6	2.5
Dexiocardia	5	2.0
TOTAL	244	100.0

TABLE II

DIAGNOSES IN ORDER OF FREQUENCY FOR AGE GROUP UNDER 45 YEARS

DIAGNOSIS	Number of Cases	Per cent
Rheumatic Heart Disease	16	57.1
Hypertensive Heart Disease	3	10.7
Degeneration of Myocardium	3	10.7
Arteriosclerotic Heart Disease with Hypertension	1	3.6
Coronary Heart Disease	1	3.6
Cardiac Enlargement Cause Unknown	1	3.6
Dexiocardia	3	10.7
TOTAL	28	100.0

being brought to his attention of which he was previously unaware. Of the 244 cardiac suspects on whom we received complete follow-up reporting, in only 21 or 9 per cent was the cardiac abnormality stated to have been previously unknown. An analysis of these 21 unknown cases of cardiac abnormality is given in Table VII.

The mere fact that the cases listed in Table VII were unknown to the patient's physician previous to the survey is not proof of value. In an attempt to more clearly define the accomplishment certain additional facts will be presented about these patients. With regard to those diagnosed as rheumatic heart disease it is hard to visualize what benefits could accrue for patients in whom this disease was first diagnosed at the ages 66, 74 and 76 years. Nature had apparently already handled the matter in an admirable manner. This is borne out by the fact that digitalis was prescribed for the 66 year old and the other two required no therapy.

TABLE III
DIAGNOSES IN ORDER OF FREQUENCY FOR AGE GROUP 45 TO 64 YEARS

DIAGNOSIS	Number of Cases	Per cent
Hypertensive Heart Disease	40	31.7
Rheumatic Heart Disease	25	19.8
Degeneration of Myocardium	24	19.0
Coronary Heart Disease	9	7.1
Arteriosclerotic Heart Disease Without Hypertension	8	6.4
Arteriosclerotic Heart Disease With Hypertension	8	6.4
Cardiac Enlargement Cause Unknown	7	5.6
Miscellaneous Heart Disease	4	3.2
Dexiocardia	1	0.8
TOTAL	126	100.0

TABLE IV
DIAGNOSES IN ORDER OF FREQUENCY FOR AGE GROUP 65 YEARS AND OVER

DIAGNOSIS	Number of Cases	Per cent
Hypertensive Heart Disease	34	38.6
Arteriosclerotic Heart Disease With Hypertension	16	18.2
Degeneration of Myocardium	13	14.8
Arteriosclerotic Heart Disease Without Hypertension	8	9.1
Rheumatic Heart Disease	7	8.0
Coronary Heart Disease	4	4.5
Miscellaneous Heart Disease	3	3.4
Cardiac Enlargement Cause Unknown	2	2.3
Dexiocardia	1	1.1
TOTAL	88	100.0

In the case of the four patients with hypertensive heart disease the outlook is more encouraging. All of these patients were overweight to a significant degree. Two were placed under a weight losing regimen which should be of benefit from the point of view of longevity, comfort, efficiency and prevention of cardiac decompensation. One case was hospitalized for acute decompensation. Why this patient wasn't already under a doctor's care is hard to understand. His symptoms should have brought him to the attention of a physician rather than an x-ray film showing cardiac enlargement.

In the four cases with cardiac enlargement of unknown origin the patients were not significantly overweight and no treatment was necessary. This could be calculated as negative accomplishment.

TABLE V
CASES REPORTED AS OVERWEIGHT IN RELATION TO TYPE OF DIAGNOSIS

DIAGNOSIS	No. of Cases	No. Overweight	Per cent of Cases Overweight
Hypertensive Heart Disease	75	51	68
Rheumatic Heart Disease	49	15	31
Degeneration of Myocardium	41	16	39
Arteriosclerotic Heart Disease With Hypertension	26	10	39
Arteriosclerotic Heart Disease Without Hypertension	16	2	13
Coronary Heart Disease	14	6	43
Cardiac Enlargement Cause Undetermined	12	6	50
Miscellaneous	6	0	0
Dexiocardia	5	0	0
TOTAL	244	106	43

TABLE VI
DEGREE OF OVERWEIGHT AMONG CASES OF HYPERTENSIVE HEART DISEASE

Per cent Overweight	Number of Cases
5	2
10	13
15	4
20	3
25	4
30	4
40	1
50	1
90	1
100	1

Of the three cases of arteriosclerotic heart disease without hypertension only one required therapy and this was in the form of digitoxin. The case of arteriosclerotic heart disease with hypertension required therapy as did the case of pericardial effusion.

In summary, of the 21 patients listed in Table VII as having cardiac abnormality previously unknown to the patient's physician, eight were actually in need of some form of therapy or medical counseling. Of the original 244 cardiac suspects therefore, actually about 3 per cent finally proved to have abnormalities of the heart previously unknown and in need of physician care or guidance. If the two cases are eliminated who were actually decompensated at the time the x-ray films were taken and should have sought medical care as a result of the existing symptoms, there is left only about 2 per cent who can be considered as having been discovered solely through the survey.

TABLE VII
TABULATION OF 21 CARDIAC ABNORMALITIES
UNKNOWN PREVIOUS TO X-RAY SURVEY

DIAGNOSIS	Age of Patients	Number of Cases
Rheumatic Heart Disease	19	
	26	
	66	
	74	
	76	5
Hypertensive Heart Disease	53	
	54	
	57	
	62	4
Cardiac Enlargement Cause Unknown	52	
	54	
	55	
	56	4
Arteriosclerotic Heart Disease Without Hypertension	55	
	68	
	72	3
Dexiocardia	39	
	46	2
Coronary Heart Disease	68	1
Arteriosclerotic Heart Disease With Hypertension	66	1
Pericardial Effusion With Congestive Failure	65	1
TOTAL		21

Discussion

In a previous report of the incidence of heart disease in a group of 43,202 persons who had small chest x-ray films, it was pointed out that of the cardiac suspects with proved heart disease 10 per cent were previously unknown to the patients' physicians.[1] In the present report this figure was

found to be about 9 per cent. The similarity of result suggests that about 9 or 10 per cent might be consistently expected.

Porte states that of the cardiacs discovered in his series of 6,599 small x-ray films of the chest 21 per cent were previously unknown.[2] Rutstein, Williamson and Moore report two similar surveys in which the per cent of previously unknown heart disease among the cardiacs discovered was 55.6 in one group of 31,091 and 31.8 in the other group of 99,791 chest x-ray films.[3] The difference between these findings and ours is apparently due to the fact that the patients are grouped as those whose cardiac disease was unknown to them whereas our patients are grouped as those whose cardiac disease was unknown to their physicians. There were several reports received by us in which the physician indicated that he already knew of the heart condition but had not told the patient. The preferable basis of evaluation would seem to be, not how many patients were previously unaware of their heart abnormality, but rather how many unknown heart abnormalities were brought to the attention of the physicians.

On the surface 9 or 10 per cent discovery of previously unknown cases of heart abnormality by 70 mm. photofluorograms would seem to be quite satisfactory. When, however, it is found that the actual number in need of medical therapy or counseling amounts to only about 3 per cent, it is difficult to ascribe much pertinent heart disease case-finding potentiality to chest x-ray surveys. Possibly it is too soon to pass final judgement but certainly we should not be carried away by premature enthusiasm.

SUMMARY

1) In a group of 154,111 photofluorograms there were 515 cases in which cardiac abnormality was suspected.

2) Questionnaires were sent to the personal physicians of the 515 cardiac suspects requesting the final diagnosis and other pertinent information.

3) There were 257 complete replies, 244 of which indicated the presence of cardiac abnormality.

4) Of the 244 cases of cardiac abnormality 21 (9 per cent) were previously unknown to the patients' physicians. Further analysis revealed that only eight of these were actually in need of medical therapy or counselling, giving a discovery rate of about 5 per 100,000 persons x-rayed for such cases, which are really the pertinent ones.

5) In evaluating the heart disease case-finding potential of 70 mm. chest x-ray surveys attention should be paid to how many previously unknown cases are found who are in need of medical attention, and not merely how many new cases of cardiac abnormality are found.

RESUMEN

1) En un grupo de 154,111 fotoflurogramas en 515 casos se sospecharon anormalidades cardiacas.

2) Se enviaron cuestionarios a los médicos personales de los 515 sospechosos cardiacos pidiéndoles el diagnóstico final y otras informaciones pertinentes.

3) Respondieron 257 de los cuales 244 indicaron la presencia de anormalidades cardiacas.

4) De los 244 casos con anormalidades cardiacas 21 (9 por ciento) eran desconocidos por los médicos de los enfermos. Análisis posteriores revelaron que solamente 8 de ellos verdadéramente tenían necesidad de terapéutica médica o consejo dando un promedio revelador de 5 de cada 100,000 personas examinadas a los rayos X que realmente les correspondia.

5) Al evaluar la posibilidad de descubrir de casos de enfermedades del corazón por la película de 70 mm. debe considerar los casos y desconocidos anteriormente son encontrados y que tienen necesidad de atención médica, y no sólamente aquellos encontrados con anormalidad cardiaca.

RESUME

1) Sur un total de 154,111 radiophotographies, les auteurs trouvèrent 515 individus suspects d'être porteurs.

2) Ils envoyèrent des questionnaires aux médecins personnels de ces malades, en demandant le diagnostic définitif et d'autres renseignements.

3) Il y eut 257 réponses complètes, dont 244 mentionnaient la présence d'une anomalie cardiaque.

4) Parmi les 244 cas d'anomalies cardiaques, 21 (9%) n'étaient pas connues antérieurement par le médecin du malade. Une analyse complémentaire montra que seulement huit de ces cas nécessitaient un traitement ou des recommendations médicales, ce qui donne un taux d'environ cinq cas pour lesquels l'examen a été légitime sur 100,000 personnes examinées aux rayons X.

5) Lorsqu'il s'agit d'évaluer la valeur diagnostique des examens systématiques par films de 700 mm., il faut attacher la plus grande attention non pas simplement au nombre de cas avec anomalies cardiaques qui sont ainsi découverts, mais au nombre de cas pour lesquels une sanction médicale est nécessaire.

REFERENCES

1 Gowen, G. H. and Frank, B.: "Screening for Chest Pathology Using Mass X-Ray Survey Technic," *Ann. Int. Med.*, 36:138, 1952.
2 Porte, Daniel: "Detection of Heart Disease in a Mass Chest X-ray Survey for Tuberculosis Case-Finding," *Ann. Int. Med.*, 36:603, 1952.
3 Rutstein, D. D., Williamson, C. R. and Moore, F. E.: "Heart Disease Case-Finding by Means of 70 Millimeter Photofluorographic Films," *Circulation*, 5:641, 1951.

Variations in the Beta-Glucuronidase Activity of Tuberculous Pleural Effusions*

S. H. LAWRENCE, M.D.†
San Fernando, California

Since the first description of a glucuronoside-splitting enzyme,[1] there has been growing interest in its variation in disease conditions. The glucuronidase activity has been suggested as a test for certain types of cancer;[2] it has been shown to be very much altered in pregnancy, and associated with toxemia;[3] and it has been proved to be related to the elimination of many toxic agents by the body.[4] Glucuronidase of bacterial origin has also been described.[5]

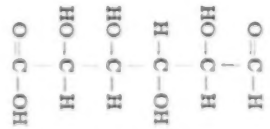
Glucose is normally oxidized during metabolic processes on the number 1 or aldehyde carbon to form gluconic acid. Under certain circumstances oxidation occurs on the number 6 carbon forming a 6 carbon chain with a carboxyl group on one end and an aldehyde group on the other.

This is known as glucuronic acid. Details of its function are not entirely clear, but it is known that it combines with several organic poisons, permitting them to be excreted in detoxified form. Inasmuch as the enzyme Beta-glucuronidase is found in abnormal concentration in such intoxications, it is thought to play a role in the conjugation as well as the hydrolysis of the substrate.

Fishman's[6] studies on the Beta-glucuronidase activity of metastatic pleural effusions suggested the determination in connection with our own experiments on pleural effusions of inflammatory origin.[7]

Methods

Beta-glucuronidase determinations were carried out according to the method described by Fishman, Springer, and Brunetti.[8] Some of the substrate, phenolphthalein glucuronoside, was obtained from a commercial source and some was prepared in our laboratory. Determinations of glucuronidase activity were made on fluid from all our routine thoracic aspirations.



Glucuronic Acid

*From the San Fernando Veterans Administration Hospital.
Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of his own studies and do not necessarily reflect the opinion or policy of the Veterans Administration.

†George Kidd, Technical Assistant.

Results

1) *Purulence of the fluid:* All fluids were classified visually according to their turbidity as 1, 2, 3, 4, 5 plus or clear. It was found that the Beta-glucuronidase activity was roughly proportional to the turbidity (Figure 1). Inasmuch as white blood cells have been found to contain the enzyme in considerable concentration[8] this result might have been expected, since the turbidity is largely due to white blood cells. That the enzyme is liberated freely into its environmental fluid was demonstrated by the fact that centrifuged specimens of turbid fluid also showed elevated activities, although not to the extent of the mixed fluid (Table I). As will be noted in Figure 1, although the enzyme concentration in the greatest number of the clear fluids is below 500 units per 100 cc., there are quite a number of specimens scattered between 1,000 units and 1,500 units per 100 cc. When compared with the levels in the blood serum, it would seem that some are in osmotic equilibrium with it, while another distinct group rises high above it (Table II). This leads to the question, where does the *extra* activity come from? We have already shown the white blood cells to be an added

TABLE I: Showing Elevation of Glucuronidase Activity in the Clear Supernatant After Removal of Pus Cells by Centrifugation.

	MIXED		CENTRIFUGED	
Patient Number	Turbidity	Activity*	Turbidity	Activity*
1	+1	444	0	360
2	+5	5244	0	3374
3	+5	4574	0	3374
4	+4	2500	0	1050
5	+4	2100	0	1050
6	+5	3912	+2	3150

*B-glucuronidase activity expressed in units per 100 cc.

TABLE II: Glucuronidase Activity of Clear Chest Fluids Compared With the Level in the Blood Serum.

		GLUCURONIDASE ACTIVITY (Units/100 cc.)
Patient	Serum	Chest Fluid
1	413	4800
2	166	666
3	333	1866
4	200	1428
5	180	150*
6	181	204*
7	333	277*
8	200	184*

*Fluids considered to be in equilibrium with the blood serum.

source of the enzyme, but this cannot explain this situation because the fluid is clear and the number of white blood cells present is small. Still there is a marked increase in concentration above the blood serum.

There could be two explanations for this increase in concentration. Either tubercle bacilli growing in the fluid produce the enzyme, or the pleural walls act as a differential secretory membrane when inflammed.

To further clarify this, tubercle bacilli were grown to optimal growth in Dubos' medium. This was centrifuged and the cell-free fluid showed no Beta-glucuronidase activity. Inasmuch as certain bacteria produce the enzyme only in the presence of a substrate,[9] 0.35 mgm. of phenolphthalein glucuronoside were added to 1 cc. of the medium. The organism failed to

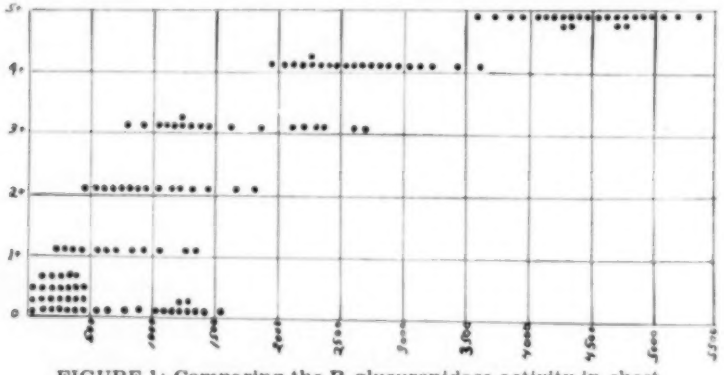


FIGURE 1: Comparing the B-glucuronidase activity in chest fluid with the turbidity of the fluid.

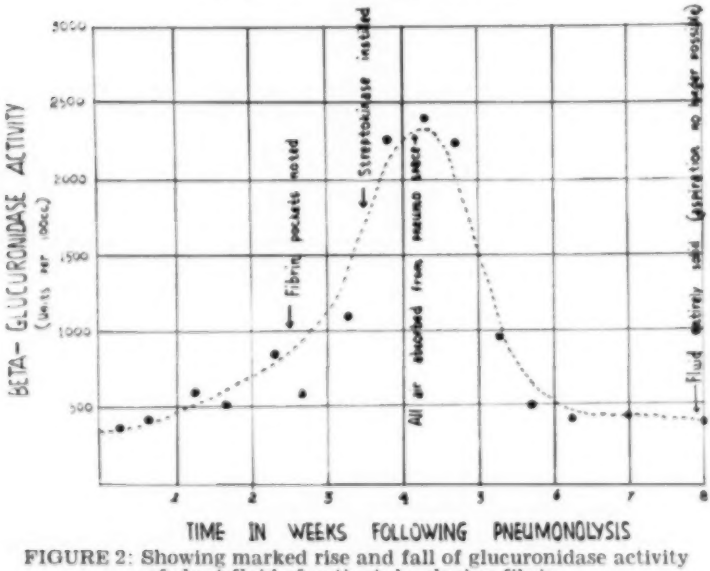


FIGURE 2: Showing marked rise and fall of glucuronidase activity of chest fluid of patient developing fibrin.

hydrolyse any of this substrate, and the fluid which remained after centrifugation showed no glucuronidase activity.

An attempt was also made to compare the glucuronidase activity of fluids with the presence of M. tuberculosis in the fluid, but no correlation could be made. Certain pleural irritants, e.g., Streptokinase-Streptodornase and Trypsin have caused a marked elevation in the Beta-glucuronidase activity. This will be reported in greater detail later. All these data are interpreted as evidence that the pleural membrane when irritated secretes the enzyme into the pleural fluid.

2) *Studies with relation to the duration of effusion:* In a few instances it was possible to follow an effusion in one patient over a prolonged period of time. One such case, J. P., showed an interesting pattern. A brief history follows:

The patient was a 41 year old white male who was hospitalized because of a small tuberculous cavity in the right upper lobe. Pneumothorax was begun shortly after hospitalization and was followed in one month by a pneumonolysis. The adhesion was a rather broad one and after it was severed, bleeding was observed through the thoracoscope. It was felt that this bleeding was controlled by cauterization after a few minutes. On the day following the operation, the right chest cavity was found to be about one-half filled with fluid which on aspiration was found to be nearly pure blood. Aspirations were performed at daily intervals for one week, and then at longer intervals. The fluid gradually assumed a clear straw-color. During the next month, however, the fluid became pocketed by fibrinous deposits and the pneumothorax was abandoned. Aspirations were continued with addition of Streptokinase-Streptodornase until a solid fibrinous deposit made further aspirations impossible. Figure 2 shows the gradual rise of enzyme activity until the formation of fibrin and its rapid fall after this.

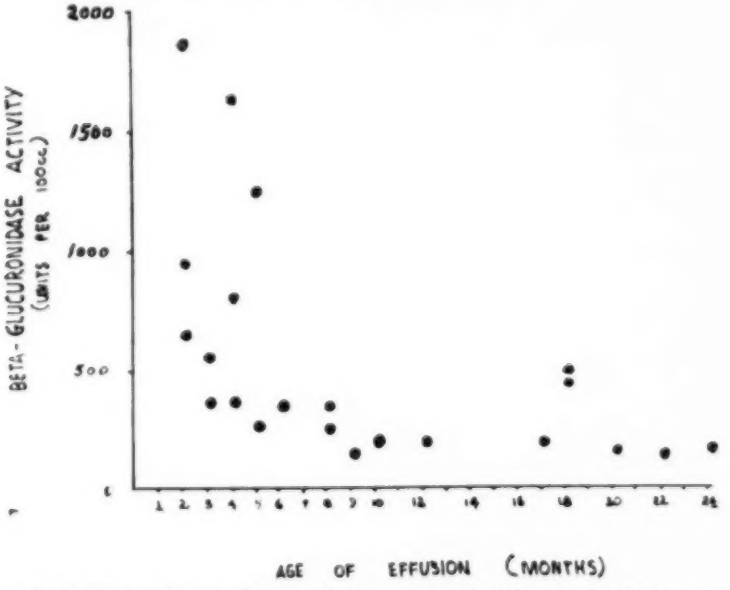


FIGURE 3: Glucuronidase activity compared with age of effusions.

It was also observed that those fluids which were of short duration contained in general, much higher enzyme levels than those of long duration (Figure 3).

3) *Beta-glucuronidase activity compared with the extent of effusion:* Figure 4 shows the variation in activity in three classes of effusions following pneumothorax. The first column, minimal, refers to those fluids which on x-ray film inspection are below the dome of the diaphragm. Moderate implies that the fluid is above the dome of the diaphragm. In the last column, no pneumothorax means that this collapse procedure has been present but was discontinued and all air absorbed.

Discussion

While there seems to be some correlation between the Beta-glucuronidase activity of pleural effusions and their clinical course (Figures 3 and 4), the exact meaning of an elevation of activity is not clear. It would have been interesting to have compared these values with those on cases of idiopathic pleural effusions, but 10 of these are available at this institution.

We can, however, compare our results with those reported by Fishman, et al.,[6] in which the activities of 10 effusions, which were not associated with infection or cancer, were analyzed. It is seen that they compare favorably with many of our clear effusions, but again the few tuberculous effusions with high glucuronidase activity are prominent (Table 3).

We cannot speculate on the relationship of the elevated Beta-glucuronidase levels reported in these studies and those reported by Fishman,

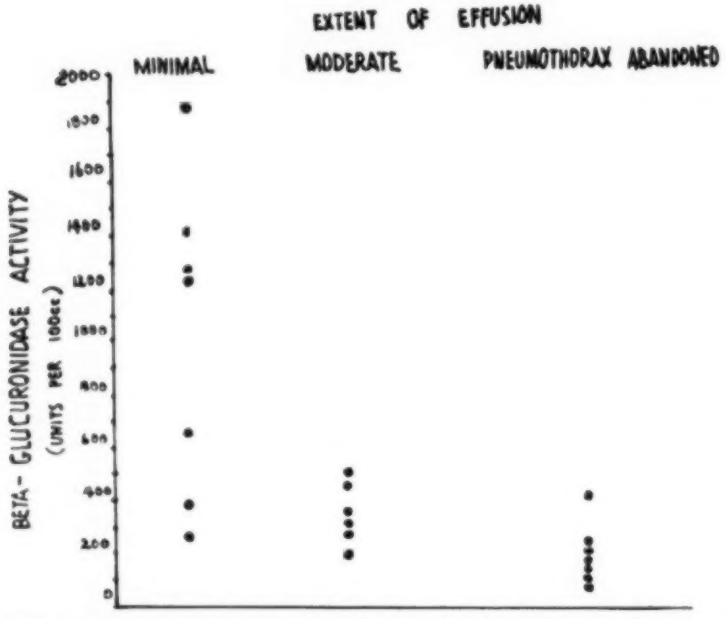


FIGURE 4: Comparing glucuronidase activity with the quantity of fluid present.

TABLE III: Clear Tuberculous Effusions are Compared with Non-tuberculous Effusions.

	Number Patients	GLUCURONIDASE ACTIVITY (Units/100 cc.) Mean	Range
Fishman's Series (non-tuberculous)	10	206	95- 393
Our Series (tuberculous)	19	558	129-1866

et al., in carcinomatous conditions. It would seem to indicate, however, that the enzyme activity may be an index of any non-specific inflammation of the pleura, in which case it would be interesting to know what factors cause the pleural membrane to become a differential secretory organ for the enzyme.

At the present it is impossible to state whether high levels of Beta-glucuronidase activity of pleural fluid in a pneumothorax space presage future difficulties with the pneumothorax. Additional studies are being continued along these lines.

Cell counts, specific gravities and protein determinations were done on the fluids but it was not felt that their results contributed anything to this study.

SUMMARY

1) Determinations of Beta-glucuronidase activity were done on specimens of fluid from all chest aspirations of tuberculous patients at this hospital during the period of study.

2) Many of these effusions contained pus cells in sufficient quantity to appear turbid. The glucuronidase activity appeared roughly proportional to the turbidity.

3) In certain clear fluids the glucuronidase activity seemed to be in osmotic equilibrium with the blood serum. The activity of others, however, rose high above that of the blood serum, and some speculations were presented regarding the source of this extra glucuronidase activity.

4) As long as fluid remained clear, the glucuronidase activity seemed to be higher in effusions of short duration than in those of long standing.

5) Certain clear fluids had a very high activity out of proportion to others of their age.

6) No correlation could be seen between the glucuronidase activity and the presence of the tubercle bacillus in the fluid.

RESUMEN

1) Se hicieron las determinaciones de la actividad de la Beta-glucuronidasa en muestras de liquido de todas las aspiraciones del torax de pacientes tuberculosos, realizadas en este hospital durante el periodo de estudio.

2) Muchos de esos derrames contenían piocitos en suficiente cantidad para aparecer turbios. La actividad de la glucuronidasa pareció ser proporcional a la turbidez.

3) En ciertos liquidos claros, la actividad de la glucuronidasa parece estar en equilibrio osmótico con el suero sanguíneo. La actividad de otros liquidos sin embargo, ascendia muy por encima de la del suero sanguíneo, y se hacen algunas suposiciones en relación al origen de esta extra actividad de la glucuronidasa.

4) Según el tiempo que el liquido permanece claro, la actividad de glucuronidasa parece ser más alta en los derrames recientes que en los antiguos.

5) Ciertos liquidos claros tienen una actividad sumamente alta, sin relación con otros de su misma fecho.

6) No pudo verse ninguna correlación entre la actividad de la glucuronidasa y la presencia de bacilos tuberculosos en el liquido.

RESUME

1) L'activité Beta-glucuronidique a été déterminée sur tous les épanchements pleuraux qui furent constatés chez les malades pendant la période de cette étude.

2) Beaucoup de ces épanchements renfermaient des cellules de pus en quantité suffisante pour qu'ils apparaissent louches. L'activité glucuronidique a semblé grossièrement proportionnelle à l'opacité du liquide.

3) Dans certains épanchements clairs, l'activité glucuronidique semble être en équilibre osmotique avec le sérum sanguin. Pour d'autres cependant, cette activité s'est élevés fortement au-dessus de celle du sérum sanguin. L'auteur fait quelques considérations sur les origine de cette activité extra-glucuronidique.

4) Tant que le liquide reste clair, l'activité glucuronidique apparait plus élevée dans les épanchements qui ont peu duré que sur ceux qui existent depuis longtemps.

5) Certains épanchements clairs ont une activité très élevée, sans rapport avec les autres épanchements du même âge.

6) L'auteur n'a remarqué aucune corrélation entre l'activité glucuronique et la présence de bacilles tuberculeux dans l'épanchement.

REFERENCES

1 Masamune, H.: "Biochemical Studies on Carbohydrates," *J. Biochem.*, 19:353, 1934.
2 Fishmen, W. H.: "Proposed Cancer Test," *J.A.M.A.*, 142:125, 1950.
3 McDonald, D. F. and Odell, L. D.: "Serum B.glucuronidase Activity During Normal and Toxic Pregnancy," *J. Clin. Endocrinol.*, 7:535, 1947.
4 Bernfeld, P. and Fishman, W. H.: "Isolation of B-glucuronidase of Calf Spleen," *Arch. Biochem.*, 27:475, 1950.
5 Barber, M.: "Destruction of Urinary Glucuronidase by Bacteria," *Nature*, 162: 701, 1948.
6 Fishman, W. H., Markus, R. L., Page, O. C., Pfeiffer, P. N. and Homberger, F.: "Studies on Effusions," *Am. J. Med. Sc.*, 220:55, 1950.
7 Lawrence, S. H. and Comden, Nathaniel: "Studies on the Behavior of Para-aminosalicylic Acid in Tuberculous Pleural Effusions," *Dis. Chest*, 18:430, 1950.
8 Fishman, W. H., Springer, B. and Burnetti, B.: "Application of Improved Glucuronidase Assay Method to Study of Human Blood B-glucuronidase," *J. Biol. Chem.*, 173:449, 1948.
9 Buehler, H. J., Katsman, P. A. and Doisy, P.: "Bacterial Glucuronidase," *Fed. Proc.*, 9:150, 1950.

Mediastinal Emphysema Following Tonsillectomy*

JACOB J. SILVERMAN, M.D., THEODORE J. TALBOT, M.D., F.C.C.P.
and ROBERT W. McCLEAN, M.D.
Staten Island, New York

Mediastinal emphysema has been reported with increasing frequency in the past several years. It occurs as a complication to a wide variety of conditions. The purpose of this report is to describe this complication resulting from a routine tonsillectomy. The operation for the removal of tonsils and adenoids has long been considered a minor surgical procedure in which the two most frequent annoyances are an occasional bleeder or a belligerent, struggling child.[1-3] This seemingly simple operation can give rise to alarming complications. The patient to be reported developed mediastinal emphysema which seriously threatened his life.

Case Report

The patient, an eight year old boy was admitted to the Staten Island Hospital on March 20, 1950 for removal of his tonsils and adenoids. Examination disclosed an unusually apprehensive child with good nutrition and development. Examination of the heart and lungs disclosed no abnormalities. The tonsils were hypertrophied, cryptic and red. There was bilateral nasal congestion and a thick postnasal mucous discharge. The cervical glands were moderately enlarged. The bleeding time was one minute and the coagulation time four minutes.

The patient was taken to the operating room on the afternoon of the day of admission to the hospital. Atropine sulfate 0.15 mg. was administered subcutaneously 45 minutes before the operation. At the start of the anesthesia, which consisted of vinythene ether, open drop, there was considerable struggling on the part of the patient. A great deal of laryngeal spasm was encountered. The tonsils and adenoids were removed without difficulty by snare and dissection. Following the operation bleeding was observed from the adenoid area and continued for some time despite local pressure. An ice collar was applied and hykinone[R] (10 mg.) was administered subcutaneously. As the effects of the anesthesia wore off the child became extremely restless and difficult to manage. In the meantime, the bleeding was finally controlled by local packs. He was observed for one hour in the postoperative room and returned to the ward. Ten hours later the child's neck was observed to be swollen. Crepitation was felt at the site of swelling. During the evening the swelling progressed to involve his entire face so that the child was unable to open his eyes. He became increasingly restless, dyspneic and cyanotic. The rectal temperature was 103 degrees F., pulse 120 per minute and respirations 38 per minute. *Seconal* was administered by rectum and sodium luminal subcutaneously. Penicillin in large doses was also prescribed. Physical examination the following day disclosed uniform swelling of the face and neck (Figure 1). There was crepitation present over the face, bilaterally in the neck, axillae and chest walls. The area of cardiac dullness was diminished. The heart sounds were faint; the rhythm was regular. A loud, crunching heart sound was heard over the entire precordium, synchronous both with systole and diastole (Hamman's sign). The blood pressure measured 100 mm. of mercury systolic and 60 diastolic. In spite of the extensive emphysema the general condition of the child now seemed slightly improved. The lungs were normal to auscultation except

*From the Medical and Surgical services of the Staten Island Hospital, Staten Island, New York.

for a few scattered crepitant rales over both lung bases. A roentgenogram of the chest at this time (Figure 2) disclosed mediastinal emphysema best seen in the lateral view. There was no pneumothorax. Because of the slight improvement in respiration and absence of any progression of the emphysema over an eight hour period the child was treated conservatively. Sedatives and antibiotics were continued. However, on the second hospital day the child became disoriented. He ran



FIGURE 1: Patient with subcutaneous emphysema of the face. Photograph taken on first post-operative day.

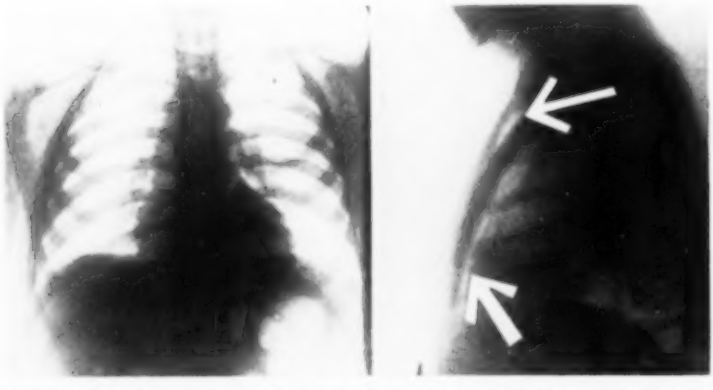


FIGURE 2: Roentgenograms of the chest demonstrating the emphysema, best seen in the lateral view. Lower arrow points to pocket of air between sternum and cardiac shadow.

a febrile course for four days. An electrocardiogram taken on the second postoperative day was normal except for an arrhythmia interpreted as a wandering pacemaker. After the third postoperative day the child showed signs of improvement with gradual subsidence of the emphysema. On the seventh hospital day the heart sounds were normal and the subcutaneous emphysema no longer was evident. A follow-up roentgenographic study now disclosed complete disappearance of the mediastinal emphysema. The lungs expanded well and there was no evidence of any pneumothorax. He was discharged from the hospital on March 26, 1950 (Figure 3). Follow-up studies one year later disclosed perfectly normal findings.

Discussion

The literature contains scattered reports of subcutaneous emphysema complicating tonsillectomies[4-13] (Table I). As a result of the investigations of the Macklins,[14-16] Hamman,[17,18] Joannides and Tsoulos,[19] Kelman and others[20,21] much information has been gathered as to the mechanism of production of this complication. The condition may develop in any situation associated with a sudden overdistention of the lungs, and the following train of events is believed to occur. The primary source of the escaped air is a ruptured pulmonary alveolus or alveoli, resulting from excessive rise in intrapulmonary pressure. Consequently, air finds its way into the connective tissue septa of the lung, producing an interstial pulmonary emphysema. The entrapped air may travel along the septa to the periphery of the lung to form subpleural emphysematous blebs which may subsequently rupture and cause a pneumothorax, or it may dissect its way to the hilus



FIGURE 3: Photograph of patient at time of discharge from the hospital.

of the lung and thence into the mediastinum to produce mediastinal emphysema. Air trapped in the mediastinum may remain there and be resorbed gradually, or, with sufficient and continued pressure may be released through several pathways: (1) through the thin parietal mediastinal pleura to produce pneumothorax, (2) through the fascial planes of the neck into the subcutaneous tissues of the head, neck, chest, abdomen, back and upper extremities, (3) through the diaphragmatic openings of the aorta and esophagus to the retro-peritoneal tissues and peritoneal cavity, even dissecting its way outward at times through the inguinal ring to the scrotum, perirectal tissues and thighs.

A necessary precursor then of subcutaneous emphysema complicating tonsillectomy is mediastinal emphysema. Mediastinal emphysema, in turn, as the Macklins have shown, rarely occurs without a preceeding pulmonary interstitial emphysema.

Mediastinal emphysema may appear in any circumstances involving forceful expiratory effort against a closed glottis and may develop during violent strain or intense physical exertion of any kind. In our patient, we believe it developed as a result of the struggling and resistance displayed in the operating room. The anesthesia was administered by the open drop method without positive pressure. This was also the method of anesthesia in the greater number of the reported cases listed in Table I. The surgeon was reasonably certain that there had been no accidental perforation of soft tissues of the neck. The amount of bleeding was not unusual. Although most children will exhibit fright to some degree this child was extremely belligerent. It is perhaps insufficiently appreciated that tremendous pres-

TABLE I: Summary of Reported Patients with Subcutaneous Emphysema Following Tonsillectomy.

Author	Age	Sex	Anesthesia	Onset	Duration
Parish,[4] 1910	28	M	Ether	10 min. P.O.	3 days
Richardson,[5] 1912	adult	M	Not stated	1 hr. P.O.	48 hours
Rosenheim,[6] 1922	21	M	Ether	12 hours	10 days
Richards,[7] 1923	12	F	Ether	Same day	2 days
	10	M	Ether	Same day	Not stated
Stein,[8] 1923	7	M	Ether	Immed. P.O.	7 days
Von Hofe,[9] 1930	2	M	Ether	Immed. P.O.	5 days
	4	F	Ether	Immed. P.O.	3 days
	2½	M	Ether	Immed. P.O.	4 days
Keen,[10] 1932	5	M	Chloro. ether	30 hrs. P.O.	11 days
Stevensen,[11] 1933	25	M	General	6 hrs. P.O.	5 days
Macready,[12] 1935	65	M	Local	1 hr. P.O.	48 hours
Baker,[13] 1936	27	F	Gas ind. to intratr. ether	12 hours	6 days
Silverman, Talbot, McClean	8	M	Ether	10 hours	6 days

sure can be built up in the pulmonary tree as a result of forced expiration against a closed glottis, the familiar Valsalva experiment. Normally, during quiet respiration, pressure in the bronchial tree is less than 5 mm. of mercury. During shouting it may increase to 70 mm. of mercury, and during coughing intrabronchial pressure may rise as high as 100 mm. of mercury.[22] The expelled air during ordinary cough can assume enormous velocity.[23] One of us (J.J.S.)[24] recently reported an attempted suicide by a psychotic who succeeded in voluntarily producing mediastinal emphysema by forcibly holding his breath.

The emotional preparation for a surgical operation, including the removal of tonsils and adenoids, is of major importance. Unfortunately, parents, physicians, and nurses sometimes fail to realize this fact when children are subjected to tonsillectomies. Many children regard an operation with fear bordering on a panic reaction.[1-3]

Mild cases of mediastinal emphysema undoubtedly occur and the condition may be overlooked or the findings misinterpreted. At this hospital over 8,000 tonsillectomies were performed since 1939 and this is the first instance in which this complication has been correctly diagnosed. It should be emphasized that the conventional posterior-anterior roentgen study of the chest may fail to disclose mediastinal emphysema. The finding in this view of a thin white line on either or both sides of the heart separated from the latter by a band of increased radiolucency will, of course, confirm the diagnosis. All studies of the chest, however, in which mediastinal emphysema is suspected should include a lateral view to detect the presence of air between the sternum and heart shadow. In our patient the lateral projectional view was diagnostic (Figure 2).

Although mediastinal emphysema in most instances subsides spontaneously with bed rest, at times mediastinal pressure may become so great as to require emergency measures as a life saving procedure. The development of cyanosis, dyspnea, weak pulse and a serious decline in blood pressure may necessitate immediate incision of the suprasternal notch to facilitate removal of air and release of pressure.[25] Relief of extensive subcutaneous emphysema has been obtained by means of superficial incisions of the skin of the chest wall and aspiration of air with an ordinary syringe and needle.

SUMMARY

1) Mediastinal emphysema, complicating a routine tonsillectomy, in an emotionally disturbed child is reported.

2) The mechanism of mediastinal emphysema is discussed, and the role of emotional influences contributing to the mechanism is described.

RESUMEN

1) Se comunica un caso de enfisema mediastínico que complicó una amigdalectomía de rutina en un niño que sufrió una alteración emocional.

2) Se discute el mecanismo del enfisema mediastínico y se describe la manera en que las influencias emocionales contribuyen a ese mecanismo

RESUME

1) L'auteur rapporte un cas d'emphysème médiastinal à la suite d'une simple amygdalectomie pratiquée chez un enfant très agité.

2) Il discute le mécanisme de cet emphysème, et le rôle adjuvant des influences émotives.

REFERENCES

1 Jessner, L. and Kaplan, S.: "Emotional Reactions of Children to Tonsillectomy and Adenoidectomy: A Preliminary Report," Problems of Infancy and Childhood. Transactions of the Third Conference, March 7-8, 1949, New York.

2 Barhash, A. Z.: "Psychiatric Techniques in Medical Practice," *J.A.M.A.*, 146: 1584, 1951.

3 Coleman, L. L.: "The Psychologic Implications of Tonsillectomy," *N. Y. State J. Med.*, 50:1225, 1949.

4 Parish, B. D.: "A Case of Subcutaneous Surgical Emphysema: An Unusual Complication Following the Removal of Faucial Tonsils," *Laryngoscope*, 20:1046, 1910.

5 Richardson, C. W.: "Tonsillectomy: Consideration and Its Complications," *Trans. Am. Laryng. Asso.*, 34:170, 1912.

6 Rosenheim, S.: "Subcutaneous Emphysema of the Neck and Chest Following Tonsillectomy in an Epileptic,—Recovery," *Trans. Am. Laryng., Rhin. and Otolog. Soc.*, 337, 1922.

7 Richards, L.: "Subcutaneous Emphysema Complicating Tonsillectomy," *Boston Med. and Surg. J.*, 189:203, 1923.

8 Stein, S.: "Surgical Emphysema Following Tonsillectomy," *Laryngoscope*, 33: 785, 1923.

9 Von Hofe, F. H.: "Emphysema of the Head and Neck Complicating Tonsillectomy," *J.A.M.A.*, 95:934, 1930.

10 Keen, J. A.: "Medical and Surgical Complications of Tonsillectomy in Childhood," *J. Laryngol. and Otol.*, 47:1, 1932.

11 Stevensen, R. S.: "Subcutaneous Emphysema Following Tonsillectomy," *J. Laryngol. and Otol.*, 48:260, 1933.

12 Macready, P. B.: "Subcutaneous Emphysema Following Tonsillectomy," *Arch. Otol.*, 42:331, 1935.

13 Baker, L. J.: "Subcutaneous Emphysema Complicating Tonsillectomy," *Canadian M. A. J.*, 34:670, 1936.

14 Macklin, C. C.: "Pneumothorax with Massive Collapse from Experimental Local Over-inflation of the Lung Substance," *Canadian M. A. J.*, 36:414, 1937.

15 Macklin, C. C.: "Transport of Air Along Sheaths of Pulmonic Blood Vessels from Alveoli to Mediastinum: Clinical Implications," *Arch. Int. Med.*, 64:913, 1939.

16 Macklin, M. T. and Macklin, C. C.: "Malignant Interstitial Emphysema of the Lungs and Mediastinum as an Important Occult Complication in Many Respiratory Diseases and Other Conditions: An Interpretation of the Clinical Literature in the Light of Laboratory Experiment," *Medicine*, 23:281, 1944.

17 Hamman, L.: "Spontaneous Mediastinal Emphysema," *Bull., Johns Hopkins Hosp.*, 64:1, 1939.

18 Hamman, L.: "Mediastinal Emphysema," The Frank Billings Lecture, *J.A.M.A.*, 128:1, 1945.

19 Joannides, M. and Tsoulos, G. D.: "The Etiology of Interstitial and Mediastinal Emphysema," *Arch. Surg.*, 21:333, 1930.

20 Kelman, S. R.: "Experimental Emphysema," *Arch. Int. Med.*, 24:332, 1919.

21 Elliot, R. W. and Sheff, M. B.: "Subcutaneous Emphysema and Pneumothorax in Bronchial Asthma," *Lancet*, 1:1104, 1938.

22 Schwerma, H. and Ivy, A. C.: "Safety of Modern Alternating Positive and Negative Pressure Resuscitators," *J.A.M.A.*, 129:1256, 1945.

23 Corylios, P. D.: "Action of the Diaphragm in Cough: Experimental and Clinical Study of the Human," *Am. J. M. Sc.*, 194:523, 1937.

24 Rosenblum, M. P. and Silverman, J. J.: "Self-Induced Mediastinal Emphysema in a Psychotic," *J. Nerv. and Ment. Dis.*, 105:414, 1947.

25 Gaudrault, G. L. and Chalmers, D. M.: "Emergency Treatment of Traumatic Emphysema of the Mediastinum," *New England J. Med.*, 224:940, 1941.

The Correlation of Carcinoma and Congenital Cystic Emphysema of the Lungs

Report of Ten Cases

EPHRAIM KOROL, M.D.*
Spivak, Colorado

In August, 1946, the several hospitals of the Veterans Administration were canvassed for cases of advanced pulmonary emphysema. Some four hundred were collected. Clinical records, roentgenograms, and available autopsy material were reviewed. One hundred cases with the most pronounced roentgen changes of emphysema were selected for follow-up study. It appeared that those with asthmatic bronchitis and bronchiectasis presenting severe clinical symptoms and postmortem findings of pulmonary overdistention, often do not show striking changes on the roentgenogram. On the contrary, many cases with spectacular x-ray highlights were found to be accompanied by but mild or no subjective complaints of dyspnea, wheezing, etc. The majority of the latter group proved to be cases of congenital cystic emphysema. There were 40 such cases in the group selected for study. At the time (October, 1936) two with congenital cystic emphysema had died of carcinoma of the bronchus. A review of the material three years later showed that two more died of bronchogenic carcinoma. By 1946 a total of seven cases in the group of congenital cystic emphysema had developed carcinoma, while this condition had not occurred in any of the 60 cases of bullous emphysema associated with pulmonary diseases. To date we have records of 10 cases of primary carcinoma of the lung which have developed in cystic pulmonary emphysema.

Review of the Literature

Nearly 500 cases of congenital cystic emphysema have been reported in the literature. Many of these cases were in infants and children, but in recent years cases have been reported in adults and in individuals of cancer age. The bulk of this literature was reviewed and it revealed that in 45 cases of congenital cystic emphysema, carcinoma was encountered as an incidental finding (See Table I).†

Statistical Analysis

The incidence of carcinoma in these 500 cases of all age groups is 9 per cent. The incidence of bronchogenic carcinoma in autopsies of adults is approximately 1.5 per cent.[1]

Among the 45 cases, six were under 30 years of age; one newborn; one

*From the Veterans Administration Hospital, Downey, Illinois.

†Complete references omitted because of lack of space.

Sponsored by the Veterans Administration. Approved by the Chief Medical Director of the Veterans Administration, who is not responsible for the opinions expressed or findings made by the author.

child of 28 months; one child of seven; one boy of 13; one of 24; one man of 28; one woman of 32. Carcinoma of the bronchus occurs but seldom under the age of 35. In Fried's series of 319 cases, none was under 30 years.[1]

It may be concluded that in congenital cystic emphysema the incidence of lung cancer is significantly greater than in the general population, and develops at an earlier age.

Case Reports

Case 1: This veteran was first examined for pension purposes on September 1, 1930, at the age of 29. He complained of slight cough. On July 24, 1922, he complained of pains in the chest, cough and bloody sputum. There was diminished expansion of the right side of his chest and feeble breath sounds. On November 19, 1924, a chest roentgenogram was described as follows: "In the right apex and right posterior axillary region there is an area, rather extensive, where there is an absence of lung markings. This may indicate a localized pneumothorax." Chest roentgenograms made in 1925, 1927 and 1928 showed no change in the lung condition, and the diagnosis of localized pneumothorax was continued. On January 14, 1929, the following findings were made: "Dull tympany over upper lobes. Retraction of right with diminished expansion, diminished breath sounds, fremitus, and voice conduction." The x-ray department reported pneumothorax (sic) in right upper chest with partial collapse of right upper lobe and adhesions laterally at the third rib level. Careful questioning did not determine when spontaneous pneumothorax had occurred. On February 21, 1929, a roentgenographic examination revealed: "The right upper lobe is in a state of collapse with a large air

TABLE I

Author and Year	No. of Cases	Age and Sex	Author and Year	No. of Cases	Age and Sex
Chiari, H., 1883	1	F-68	Ivaniesewich, O., 1934	1	M-38
Prof. Dr. Ribbert, 1896	1	F-54	Pearson, E. F., 1935	1	28 mo.
Stoerk, Oskar, 1897	1	Fetus	Friedman, Eugene, 1936	1	M-51
Linser, P., 1899	1	M-13	Pierre, Bourgeois, 1937	1	M-24
Kretchmer, Walter, 1904	1	F-34	Cozzuti, G., 1937	1	M-22
Helly, Konrad, 1907	1	F-43	Key, Einar and Wahlgren, Fredrick, 1937	1	F-37
Lohlein, M., 1904	1	F-69	Castex, M. R. and Mazzei, E. S., 1941	1	M-43
Siegmund, H., 1922	2	—		1	—
Policard, F., 1923	1	—	Mallory, Tracy, 1941	1	M-45
Nakazone, K., 1923	1	M-61	Womack, N. A. and Graham, E. A., 1942	4	—
Frommel, Ed., 1933	1	M-42	MM Guichard, Plauchu, Berard et Roche, 1943	1	—
Schwyter, M., 1928	1	M-65	Even, R. et Le Coer, J., 1943	1	F-48
	1	M-58	Stewart, M. J. and Allison, P. R., 1943	1	F-43
	1	F-46	Soreano Gimenez and A. Balcells-Corina, 1945	2	—
	1	M-	MM Maurer et Rolland, Louigi et Castlebon, 1946	1	-56
	1	F-42	Painso, R., Charpin, J. et Martin, P., 1948	1	M-46
Obendorfer, S., 1930	1	F-74			
Frommel, Edouard, 1927	4	—			
Sommer, Arne M., 1934	1	- 7			
Drouet, P. L., 1947	1	M-46			
Bass, H. E. and Singer, E., 1951	1	M-59			

pocket running from apex to eighth rib posteriorly and first rib anteriorly." The veteran was admitted to the Veterans Administration Hospital, Minneapolis, Minnesota, on November 12, 1931, with symptoms of brain tumor. There had been severe pains in the upper right chest for over one year and there was distressing cough. He died November 21, 1932. Postmortem examination performed by Dr. L. E. Nolan showed that there was no pneumothorax. The right upper lobe consisted of several emphysematous sacs. In one of them there was a cauliflowerlike mass. There were several white-yellow firm nodules, 1 cm. in diameter, along the right upper lobe bronchus following its course outward toward the periphery. Histologically "there is a proliferation of epithelial cells arranged in a branching infiltrating pattern, having the appearance of prickle cells. Mitotic figures are very numerous." A tumor mass was found in the left lobe of the cerebellum. The lung cavities are lined with cuboidal epithelium.

Case 2: Enlisted in the Army on March 29, 1918, at the age of 23 years. He complained of shortness of breath on exertion, a condition which had existed since childhood. He was kept on light duty, and was discharged December 20, 1918. On December 26, 1927, at the age of 32, he complained of pains in the left breast and shortness of breath. On March 7, 1930, there was shortness of breath and pain over the precordium on exertion. There were sibilant and sonorous rales scattered over the lungs. X-ray examination of the chest on September 18, 1930, revealed "pneumothorax" extending from the left apex to the level of the fourth rib anteriorly, and from the right apex to the level of the third rib anteriorly. On October 22, 1931, he weighed 119 pounds. The roentgenologist reported "complete pneumothorax above fourth rib on each side. No collapsed lung seen in the mediastinum." On October 4, 1935, he was weak, emaciated and dyspneic at rest. Breath sounds were absent except over the bases. A roentgenogram revealed the shadow of a circumscribed dense mass in the left hilum region inside the air pocket. A roentgenogram on February 19, 1936, showed enlargement of the mass in the left lung root (Figure 1). Postmortem examination, April 4, 1936 revealed: "The lungs ballooned out upon opening the chest and remained distended even after considerable manipulation. The right upper lobe presented one sac occupying four-fifths of the left chest cavity. A solid tumor 4 cm. in diameter was present along the left main descending bronchus. Tissue examination showed it to be a bronchogenic carcinoma."

Case 3: This 52 year old veteran was admitted to the Veterans Administration Hospital, Batavia, New York, on September 11, 1946, with a provisional diagnosis of tuberculosis of a kidney. About four months prior to admission he lost his appetite, felt tired, and gradually lost 30 pounds in weight. Pain developed in the back of the right chest which radiated downward and anteriorly into the groin. Recently his wife noticed a lump beneath his right shoulder blade. On physical examination there were shotty lymph nodes palpable over the sternal notch and in the anterior and posterior triangles of the neck. Along the region of the ninth rib posteriorly on the right side, there was a mass the size of a lemon, firm, moderately tender, apparently attached to the rib beneath it. A wheeze was heard over the right upper lung field. There was no other abnormal finding. A roentgenogram of the chest was interpreted to show cystic emphysema in the upper lobe of the right lung. There was partial erosion of the right ninth rib posteriorly, with a soft tissue shadow adjacent to it. The posterior portion of the 11th rib also shows destruction (Figure 2a). Gastro-intestinal roentgen series showed no ulcer or mass in the stomach. Gastric analysis revealed the presence of free hydrochloric acid. Subjectively there were no digestive complaints. Bronchoscopic examination was equivocal, and no intraluminal mass was seen. Biopsy of cervical lymph node revealed: "Marked destruction and replacement by fibrous tissue and deposits of malignant tissue consisting of solid sheets of epithelial cells which show considerable variation in size and shape and many mitotic figures. No gland



FIGURE 1

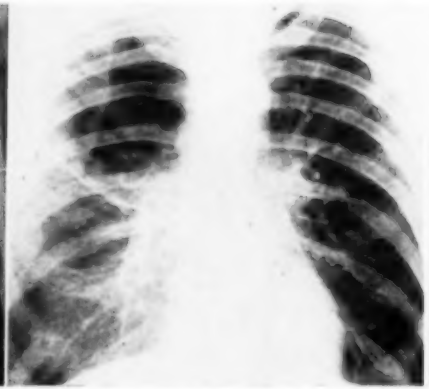


FIGURE 2a



FIGURE 2b

Figure 1: Large air cysts in both lungs. Note absence of shadows of ascending pulmonary arteries. Arrows point at tumor mass.—*Figure 2a:* September 11, 1941. Large air cyst in right lung, the lower border paralleling the fourth rib. Note absence of shadows of ascending pulmonary vessels on the right side. The vertebral end of the 11th rib is destroyed by tumor.—*Figure 2b:* February 12, 1947. Large mass has developed at base of right side of chest and in upper mediastinum.

acimi are seen." Diagnosis: "Anaplastic carcinoma, metastatic to lymph node. The origin is either bronchial or gastric." As we had previously observed several cases of cystic emphysema to develop bronchial carcinoma, we made a diagnosis of bronchogenic carcinoma in the absence of bronchoscopic findings and direct roentgen signs of tumor. He was transferred to the Veterans Administration Tumor Center, Bronx, New York, where the diagnosis of bronchogenic carcinoma was confirmed. On February 12, 1947, he was reported in severe dyspnea. There was dysphagia and regurgitation of fluids through the nose. A roentgenogram (Figure 2b) showed a large mass with no cardiac displacement, in the base of the chest. There was a new shadow in the upper mediastinum encroaching on the trachea.

Case 4: This 52 year old railway mail clerk was examined at the Veterans Administration Hospital, Batavia, New York, at the request of the Railroad Retirement Board during the spring of 1946. He complained of increasing shortness of breath, cough and wheezing in the chest of several months duration. He was found to have extensive emphysema, resembling localized pneumothorax on the roentgenogram, in the right upper lung field and at the left base. There was a pear shaped mass in the left lung root. He was readmitted to the surgical service of the hospital on September 13, 1946, with symptoms of pyloric obstruction of four weeks standing. He was emaciated and there was a large mass in the abdomen connected with the liver. The roentgenographic examination showed a large filling defect on the lesser curvature of the stomach, interpreted as carcinoma. The chest roentgenogram revealed the areas of cystic emphysema unchanged, but the shadow in the left hilum had enlarged. The diagnosis lay between primary carcinoma of the stomach with metastasis to the lung, and primary carcinoma of the bronchus. Due to our experience with the proneness of cystic emphysema to develop carcinoma, we preferred the diagnosis of bronchogenic carcinoma. Postmortem examination demonstrated a tumor nodule in the left lower lobe bronchus. The deformity and displacement of the stomach was produced by metastatic tumors in the liver. The stomach was free of tumor and ulcer. The lungs contained large, thin walled air sacs in both upper lobes.

Case 5: This veteran had a roentgenogram of the heart made in February 1933. There was no lung complaint at the time. The film showed a large air cyst in the upper two-thirds of the right lung; the cyst had a dense lower border, concave upward, crossing the ninth rib. During the fall of 1941, at the age of 47, he developed pains in the right thigh, worse in the region of the buttock. A mass developed in the right ischial region which made sitting painful. He lost 20 pounds in weight. Examination of the lungs on January 26, 1942, showed distant breath sounds over the right lung anteriorly, and over the lower two-thirds of this lung posteriorly. Over the right ischial area, extending along the inner side of the thigh and into the groin, there was a firm smooth mass, the size of a baseball. The chest roentgenogram showed the air cyst persisting in the right lung. The lower and outer corner of the cyst was occupied by a dense quadrangular mass, 6 by 10 cm. The base of the mass coincided with the lower border of the cyst (Figure 3). The roentgenogram of the pelvis showed destruction of the ramus and the ischium on the right side. Biopsy of the tumor mass resulted in the diagnosis of adenocarcinoma, metastatic, probably of bronchial origin. A diagnosis was made of bronchogenic carcinoma of the right lung with metastasis to the pelvic bones, liver and abdominal wall. The man was transferred to the Veterans Administration Tumor Center, Bronx, New York, where the diagnosis of bronchogenic carcinoma was confirmed.

Case 6: This 54 year old professional soldier was admitted to the hospital on February 1, 1947, with a provisional diagnosis of pulmonary tuberculosis. He had had productive cough for several years. During the fall of 1946 he began to lose

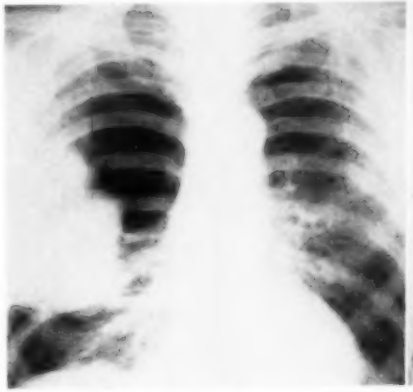


FIGURE 3



FIGURE 4a



FIGURE 4b

Figure 3: Large tumor in air cyst on right. Note absence of shadows of hilar vessels. — *Figure 4a:* April 8, 1936. Note several large air cysts in right lung.—*Figure 4b:* November 3, 1938. Note large hilar mass on right. The larger cysts have collapsed. Note contraction of chest.

weight and strength and lost his voice in December. His cough increased and his sputum became purulent. The left chest was flattened and had diminished expansion. There was dullness over the left side of the manubrium and below the seventh dorsal spine; the breath sounds were distant to absent over the greater portion of the lung anteriorly and posteriorly. Coarse moist rales were heard below the fourth rib. The chest roentgenogram showed a multilocular air cyst or cavity occupying the left chest above the level of the second rib, with no vascular markings in this region. The base of the left lung presented a myriad of soft densities, outlining several annular areas of increased transparency. The diaphragm was high and immobile on the left side. Laryngoscopy revealed paralysis of the left vocal cord. Painstaking examination of the sputum for tubercle bacilli gave negative results. Laminograms of the chest showed a mass to the left of the trachea compressing the trachea and the left main bronchus. There were patchy and spotty densities around cyst-like spaces in the left lower lung and several larger ones in the left upper lobe. On September 18 the patient had a severe pulmonary hemorrhage and expired in a few minutes. Postmortem revealed a large mass involving the cavity in the upper lobe and extending medialward to the tracheo-bronchial lymph nodes. The mass encompassed the left main bronchus and a branch of the left pulmonary artery which was eroded by the tumor. The mucosa of the left bronchus was granular in appearance and presented numerous small, yellow-white papillary projections. Numerous small tumor nodules were scattered through this lower lobe. Histologically, the tumor tissue consisted of sheets and cords of poorly demarcated epithelial cells. The cystic spaces were lined with cuboidal epithelium. The question may be asked whether the emphysematous changes antedated the carcinoma, or whether they developed as a result of bronchostenosis. In our opinion, the epithelial lining of the air spaces identify them as congenital cystic emphysema.

Case 7: A colored man, age 55, was admitted to the hospital on December 3, 1942, with a provisional diagnosis of lung abscess. He had complained of shortness of breath for some 10 years. During the summer of 1942 he developed a cough productive of blood streaked sputum. He had pain in the right side of his chest, and he lost weight and strength. The chest expansion was limited on the right side, and there was dullness over the manubrium, but there was no other abnormal lung sign. There was a hard lymph node above the right clavicle. The sputum was sanguinopurulent, not malodorous, negative for tubercle bacilli. A chest roentgenogram dated February 23, 1933, showed evidence of extensive cystic emphysema involving the upper halves of both lungs. No lung markings were visible above the third rib on either side. Shadows of the larger pulmonary arteries were also absent in the upper chest. The x-ray film of December 4, 1942, showed the emphysematous condition unchanged on the left side. On the right side the cyst has greatly contracted, its lower border formerly crossing the sixth rib was in the first interspace. The cyst contained fluid with a horizontal upper level. A dense triangular shadow had appeared in the upper mediastinum on the right side. Bronchographic examination disclosed an obstructing lesion in the right upper lobe bronchus and no radiopaque substance could be made to enter the abscess cavity. During the months of January and February 1943, the swellings in the neck enlarged and there was increasing difficulty in respiration and deglutition. He died on February 14, 1943; autopsy was not permitted.

Case 8: A man of 47 was admitted to the Veterans Administration Hospital, Lincoln, Nebraska, on June 6, 1944. He complained of losing weight and strength during the past one and one-half years. He had expectorated blood at intervals since 1935. The cough had increased recently and there had been pleurisy pains in the right side. A chest roentgenogram made in February 1935, showed several annular transparencies in the left lung root zone. The right apex was transparent, and the ascending vascular shadows were absent in the right lung root, an ap-

pearance typical of cystic emphysema. The chest x-ray film of June 7, 1944, showed the areas of emphysema as described in February 1935. In addition, there was a large oval shadow to the right of the heart, extending upward to encompass the lung root. The large mass contained several clear areas opposite the fourth and fifth cartilages on the right side. He died in an attack of hemoptysis on October 11, 1945. Autopsy revealed a massive carcinoma in the right lung. Histologically, the lung showed several distended alveoli-like spaces, lined with cuboidal epithelium.

Case 9: A 60 year old white male veteran was admitted to the Veterans Administration Hospital, Staten Island, New York, on July 17, 1947. For over 30 years he had been considered to have mild asthma. During the spring and summer of 1947 he lost 10 pounds in weight, and had pleurisy pains on the left side. A small lump appeared on the top of his head. On physical examination, he was poorly nourished and somewhat confused mentally. There was a small tender nodule over the vertex. There was decreased expansion of the left chest with percussion dullness, absent breath sounds and wheezing rales over this side. No abnormal sign was elicited on the right side. The chest roentgenogram showed evidence of a large tumor mass in the left lung root and several emphysema cavities in the left upper lobe. Sputum was negative for tubercle bacilli; Wassermann test was negative. He developed hoarseness and difficulty in swallowing. The expectoration was bloody on several occasions. The lesion on the head was painful and it grew rapidly. The liver was enlarged. Fever developed and there was increasing dyspnea and cyanosis. He died in an oxygen tent on August 11, 1947. Autopsy revealed carcinoma of the left lung. The upper lobe presented a system of interlocking "bleb spaces" lined by cuboidal epithelium. The diagnosis was carcinoma, bronchogenic, with metastasis to skull.

Case 10: This 39 year old Negro, first examined on April 8, 1936, complained of shortness of breath and slight cough for 14 or 15 years. The roentgenogram (Figure 4a) showed several large thin walled areas devoid of lung markings; one of these extending from the apex to the first rib, the other beneath it extended to the second rib. One cavity extended from the second to fifth rib anteriorly; there was compressed lung beneath it. On March 10, 1938, he was admitted to the Veterans Administration Hospital, Alexandria, Louisiana, with fever, night sweats and bloody expectoration of four weeks duration. The chest roentgenogram showed a change from that of April 8, 1936, the air spaces having disappeared on the right side. There had developed a large dense shadow in the right hilar region. On June 2, 1938, the oval shadow near the upper margin of the aortic arch had increased considerably. Further enlargement of the tumor was reported on November 3, 1938 (Figure 4b). There were pains in the spine and head, and x-ray signs of bone metastasis appeared in the skull, cervical vertebrae, and in the mandible. There was increasing difficulty in deglutition. He died on December 1, 1938.

SUMMARY

Ten cases of carcinoma of the lung developing in middle-aged war veterans with congenital cystic emphysema of the lung were reported. Seven were found in a follow-up study of 40 cases of congenital cystic emphysema over a period of 13 years.

In 60 cases of diffuse pulmonary emphysema complicating bronchial asthma and lung infections followed for the same length of time, no bronchial carcinoma developed.

A review of the literature disclosed 45 cases (9 per cent) of lung cancer among 500 persons of all age groups with congenital cystic emphysema.

The incidence is 1.5 per cent in autopsies of adults in the general population.

In cystic emphysema, carcinoma occurs at an earlier age and with a significantly greater frequency than in the general population.

RESUMEN

Fueron referidos diez casos de carcinoma del pulmón en veteranos de la guerra en la edad media de la vida con enfisema cístico congénito. Siete más fueron encontrados en un estudio de 40 casos de enfisema cístico congénito seguidas en un período mayor de 13 años.

Sesenta casos de enfisema pulmonar difuso complicando asma bronquial e infecciones del pulmón, se estudiaron por el mismo período de tiempo.

Una revisión bibliografica descubrió 45 casos (9 por ciento) de cancer pulmonar entre 500 personas de todas edades con enfisema cístico congénito. La frecuencia es de 1.5 por ciento en autopsias de adultos de la población general.

En el enfisema cístico, el carcinoma ocurre a una edad más temprana y con una frecuencia significativamente mayor que en la población general.

RESUME

L'auteur rapporte dix cas de cancer du poumon survenus chez des vétérans de la guerre, d'âge moyen, qui étaient atteints de poumon polykystique congénital. Sept ont été découverts lors d'une étude complète de quarante cas de maladies kystiques congénitales, suivies pendant une période de treize ans.

Dans soixante cas d'emphysème pulmonaire diffus, compliquant un asthme et une infection pulmonaire, qui furent suivis pendant la même durée, on ne constata aucun cas de cancer. Une revue de la litérature donne quarante-cinq cas de cancer pulmonaire chez 500 personnes de tous âges, atteintes d'emphysème kystique congénital (soit 9%). Dans l'ensemble de la population, le pourcentage de cancers découverts à l'autopsie est de 1.5%.

Dans l'emphysème kystique, l'apparition d'un cancer se fait chez des gens beaucoup plus jeunes, avec une beaucoup plus grande fréquence que dans l'ensemble de la population.

REFERENCE

1 Fried, B. M.: "Bronchiogenic Carcinoma and Adenoma," The William and Wilkins Co., Baltimore, 1948. Tables 4 and 9.

Pulmonary Emphysema and Fibrosis*

SAMUEL S. ALTSHULER, M.D., FRED S. PREUSS, M.D.,**
FRANK G. DRISCHEL, M.D. and JAMES E. O'HARE, M.D.
Tucson, Arizona

Emphysema may be a normal process of aging. In a variety of chronic lung diseases, such as tumors, empyema or asthma, lung tissue is destroyed or collapsed. In such cases, *compensatory emphysema* of the contiguous tissue may result. Also following lobectomy or pneumonectomy or in pneumonia and tuberculous consolidation there may be compensatory emphysema. The unaffected lung or portions thereof increase greatly in size due to the distention of air vesicles. The alveolar walls are stretched and ultimately break, contiguous air cells fuse, thus producing emphysema. In *hypertrophic* (or "large-lunged") *emphysema* the abnormal changes are: enlargement of the lungs due to marked alveolar distension, atrophy of the alveolar walls due to stretching, imperfect aeration of the lungs and blood, and marked dyspnea, without apparent cause.

Pathology

Description of the morphological features and the pathology of pulmonary emphysema and fibrosis is based upon a study of 37 autopsies in which emphysema and/or fibrosis were the main or incidental findings and constituted the main or contributory cause of death. The 37 autopsies constituted 26.4 per cent of 140 consecutive autopsies performed at this hospital. The following table shows the classification of these 37 cases:

Hypertrophic emphysema	6
Bronchial asthma and emphysema	8
Bronchogenic carcinoma and emphysema	7
Pulmonary tuberculosis and emphysema	9
Silicosis and emphysema	2
Bronchiectasis and emphysema	1
Senile emphysema	3
Diffuse interstitial fibrosis	1

Cause of Death: In the series of 37 cases, the causes of death were as follows:

Pulmonary tuberculosis	11
Decompensation of cor pulmonale	8
Carcinoma spread with bronchopneumonia	6
Anoxia due to bronchial obstruction in asthma	3
Bronchopneumonia	2

*Presented at Regional Meeting, American College of Physicians, Tuscon,Arizona, October 14, 1950.

From the Veterans Administration Hospital, Tucson, Arizona.

Reviewed by the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are a result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

**Present address: City of Hope, Duarte, California.

Spontaneous pneumothorax	2
Coronary occlusion	2
Decompensation in arteriosclerotic cardio-vascular disease	1
Pulmonary embolism	1
Status asthmaticus with possible overdose of adrenalin	1

Treatment

Surgical Treatment of Pulmonary Emphysema: The surgical treatment of pulmonary emphysema is limited to those cases in which one or more giant bullae cause a marked decrease in vital capacity by their mechanical compression of adjacent and more nearly normal lung tissue. This condition may be treated by open thoracotomy and resection of the bullae or by an adoption of the Monaldi drainage principle. The first method is preferred, the second reserved only for those patients whose condition is so desperate as to preclude open operation. Case reports illustrating the use of each procedure follow:

Case 1: A 36 year old white male was admitted to the hospital on March 8, 1949, because of dyspnea which had become progressively worse since its onset in 1942. He suffered from a chronic productive cough, asthmatic attacks induced by effort or weather change and severe dyspnea on slight effort. He reported a recent 10 pound weight loss. Physical examination revealed a thin man whose accessory muscles of respiration were hypertrophied. His chest was barrel-shaped. Breath sounds were distant and there were numerous sibilant and sonorous rales bilaterally. Vital capacity was 1.0 liter compared to an expected normal of 4.0 liters. X-ray films showed evidence of a large cyst occupying about 80 per cent of the right lung field and multiple smaller cysts in the left upper lung field. E.K.G. showed right heart hypertrophy with myocardial damage. On May 2, 1949, right thoracotomy was performed and a large pulmonary cyst in the upper lobe was excised. The postoperative course was satisfactory and his vital capacity was doubled. An operation on the left side was performed 10 months after the first, because the cyst on the left had been increasing in size. He withstood this procedure without complications. His pulmonary condition is now satisfactory except for occasional asthmatic attacks well controlled by the use of ephedrine.

Case 2: A 55 year old white male was admitted to the hospital in August 1949, with chief complaint of chronic and paroxymal shortness of breath. He gave a history of chest disease dating back to 1917. Physical examination revealed a thin, chronically ill man whose weight was 107 pounds, compared with previous weight of 140 pounds. Chest appeared emphysematous and asthmatic wheezes were heard over both lung fields. Clinical examination of the heart revealed no abnormalities. Blood pressure was 120/90. Vital capacity was 1.3 compared with an expected normal of 4.0 liters. X-ray films showed evidence of a large emphysematous bleb which occupied the upper half of the right lung field. The left lung exhibited diffuse emphysematous changes. After treatment on the medical service, he was transferred to the surgical service for observation. The preferred surgical treatment would have been excision of the emphysematous bleb by open thoracotomy, but it was felt that because of the poor general condition it was a question of doing a Monaldi type procedure or nothing. His E.K.G. showed a left bundle branch block and the cardiologist was emphatic in recommending against any major surgery. In two stages and under local anesthesia, a catheter was placed in the cyst through the bed of a short segment of rib which had been resected high in the right axilla. He withstood the procedures well but it was necessary to apply a high degree of negative pressure for almost four weeks before any decrease in



FIGURE 1



FIGURE 2



FIGURE 3

Figure 1: Pulmonary emphysema with fibrosis, lateral view; barrel-shaped chest. — *Figure 2:* Severe alveolar emphysema with depressed diaphragms, increased fibrosis and hyperaeration. There is Grade III enlargement of pulmonary arteries and pulmonary conus, and increased width of intercostal spaces.—*Figure 3:* Large pneumatoceles in both lung fields (bullous emphysema).

the size of the cyst was noted. Difficulty was also encountered in keeping the catheter in place and patent. However, the cyst was reduced to approximately one-third of its original size, he gained 22 pounds in weight, his dyspnea improved subjectively and objectively his vital capacity increased from 1.3 to 2.2 liters. Four months after the operation he still had a small catheter in place as a drain, while the remaining portion of the cyst was fibrosing. The catheter required little attention and he was well enough to leave the hospital.

Medical Treatment of Pulmonary Emphysema: Medical treatment of emphysema and fibrosis is limited to alleviation of symptoms. Oxygen by mask is the most effective means of relief and should be available to the patient at all times during an acute attack. Adrenalin, potassium iodide and morphine sulphate may afford some relief. If bronchitis is also present, aerosol penicillin may be used.

Artificial pneumoperitoneum and abdominal supports have been used to relieve dyspnea.[1-3] The former will produce a more physiologic diaphragm function than the latter since the use of the voluntary abdominal muscles as a respiratory adjunct is rendered more effective. Both procedures elevate the diaphragm without undue resistance to the inspiratory movement. Intra-abdominal pressure during inspiration and a more rapid return of the diaphragm to an elevated resting position during expiration. Pneumoperitoneum produces a greater and more sustained elevation of the diaphragm than does the use of an abdominal support; also, it is less uncomfortable for the patient confined to bed.

The authors acknowledge their appreciation to Mr. Peter Branconi, Laboratory Technician, and Mr. Joseph E. Mineo, Medical Photographer, for their technical assistance.

SUMMARY

1) Thirty-seven patients with pulmonary emphysema and/or fibrosis have been reviewed. The outstanding symptoms are dyspnea, cyanosis and cough. The main findings on examination are barrel-shaped chest with limited respiratory excursion, hyper-resonance on percussion, hypertrophy of the auxiliary respiratory muscles and decreased pulmonary function. Roentgenograms are typical showing hyperaeration and/or fibrosis. Review of autopsy findings reveals simultaneous occurrence of emphysema and fibrosis in almost all cases. Emphysema involves either both lungs diffusely in the vesicular form or forms irregular, large "air cysts" in the bullous form. Frequent complications are recurrent pneumonia, hypertension of the lesser circulation with pulmonary atherosclerosis and cor pulmonale, spontaneous pneumothorax and cerebral changes.

2) No specific cause is known.

3) Treatment is unsatisfactory and is limited to the alleviation of symptoms, oxygen being the most effective agent. Artificial pneumoperitoneum and abdominal supports have been used to relieve dyspnea. Surgical intervention is reserved for cases with one or more giant bullae and consists of resection or drainage of the bullae.

FIGURE 4

FIGURE 5

Figure 4: Idiopathic progressive fibrosis, etiology undetermined. This condition was progressive, with increasing evidence of emphysema, cardiac involvement with extreme dyspnea.—*Figure 5:* Bullous emphysema.

RESUMEN

1) En 37 enfermos con enfisema pulmonar y fibrosis o esta sola, los síntomas destacados son disnea, cianosis y tos. El hallazgo principal al exámen es el torax en forma de barril con excursión respiratoria limitada, hiper-resonancia a la percusión, hipertrofia de los músculos auxiliares de la respiración y decrecimiento de la función pulmonar. Los roentgenogramas son típicos y muestran aumento de la aeración y/o fibrosis.

La revisión de los hallazgo de autopsia revelan la presencia simultánea de enfisema y fibrosis en casi todos los casos. El enfisema compromete ambos pulmones difusamente en la forma vesicular o en la forma irregular, o se hallan grandes "quistes aereos" en la forma bulosa. Las complicaciones frecuentes son la neumonía a receptión, hipertensión de la circulación menor, con ateroesclerosis pulmonar y cor pulmonale, neumotorax espontáneo y trastornos cerebrales.

2) No se conoce su causa especifica.

3) El tratamiento no es satisfactorio y se limita a aliviar los síntomas, siendo el oxígeno el recurso mas efectivo. Pueden usarse para aliviar la disnea el neumoperitoneo artificial y los soportes absominales. La intervención quirúrgica se reserva para los casos con una o mas bulas gigantes y consiste en resección o drenaje de la bula.

RESUME

1) Chez 37 malades, atteints d'emphysème pulmonaire et de sclérose, les symptômes fréquents sont la dyspnée, la cyanose et la toux. Les symptèmes essentiels à l'examen sont l'existence d'un thorax large avec limitation des mouvements respiratoires, hyper-sonorité è la percussion, hypertrophie des muscles respiratoires accessoires, et diminution de la fonction pulmonaire. L'examen radiologique montre les signes typiques d'hyper-aération et de sclérose. L'étude des constatations d'autopsie montre qu'il y a association d'emphysème et de sclérose pulmonaire dans la plupart des cas. L'emphysème atteint les poumons d'une façon diffuse dans la forme vésiculaire ou bien constitute dans le type bulleux de grands "kystes aériens." Les complications fréquentes sont des pneumopathies récidivantes, l'hypertension de la petite circulation avec athérome de l'artère pulmonaire et coeur pulmonaire, pneumothorax spontané et altérations encéphaliques.

2) On ne connait pas de cause spécifique de ces troubles.

3) Le traitement est peu satisfaisant et se limite à l'atténuation des symptômes, l'oxygéne à l'action la plus efficace. On a utilisé le pneumopéritoine et le maintien de l'abdomen pour diminuer la dyspnée. Les interventions chirurgicales sont réservées aux cas où une ou plusieurs bulles géantes existent et consistent dans le drainage ou la résection de ces bulles.

REFERENCES

1 Kountz, W. B. and Alexander, H. L.: "Emphysema," *Medicine*, 13:251, 1934; "Symptomatic Relief of Emphysema by an Abdominal Belt," *Am. J. Med. Science*, 187:687, 1934.

2 Carter, M. G., Gaensler, E. A. and Kyllonen, A.: "Pneumoperitoneum in the Treatment of Pulmonary Emphysema," *New England J. of Med.*, 243:549, 1950.

3 Furman, Robert H. and Calloway, James J.: "Artificial Pneumoperitoneum in Treatment of Pulmonary Emphysema," *Dis. of Chest*, 18:232, 1950.

Segmental Postural Drainage in Pulmonary Disease

IRVING J. KANE, M.D., F.C.C.P.*
New York, New York

The effectiveness of present antibiotics and the increased possibilities for early recognition and successful medical treatment of suppurative lung disease has made necessary a revision of our concept of postural drainage. Extended knowledge of the segmental nature of many of these pulmonary conditions and the increased ability to recognize these anatomical lung units on the chest roentgenogram,[2,3,5,6] makes possible a more effective application of the principles of postural drainage.

Postural drainage, as its name implies, is the application of the forces of gravity to the removal of fluid or semifluid material from the pulmonary parenchyma, and from the bronchi, e.g. lung abscess and bronchiectasis. Segmental postural drainage is a more selective application of these gravitational forces to the specific bronchopulmonary segment or segments involved by such diseases. The more accurately one applies the influence of gravity to the specific lung unit and its draining bronchus, the more effective will such treatment be. The sooner drainage is established and integrated with measures for control of infection, the more reasonable it is to expect that irreversible lung damage will be minimized.

Localization and identification of the diseased bronchopulmonary segment on the chest roentgenogram is a cardinal prerequisite to the successful application of selective pulmonary drainage. References to this subject have been indicated above. The terminology used in this paper with reference to the bronchopulmonary segments is basically that suggested by Jackson and Huber.[4]

Indications

The therapeutic indications for segmental postural drainage arise not only in medical and surgical practice, but also in pediatrics. Suitable medical cases include those suppurative lung diseases in which early treatment makes possible a chance for cure and those in which extensive bilateral disease or severe debility precludes surgical intervention. Among the former may be included suppurative bronchopneumonia and acute lung abscess, among the latter conditions are extensive bilateral bronchiectasis and chronic lung abscess, associated with serious cardiorespiratory difficulties or other severe debilitating disease. Whether the goal for such therapy is cure or palliation, the principles remain the same.

Segmental postural drainage is also indicated in preparation for pulmonary resection. The purpose in preoperative treatment for an infected lung is to reduce the chances for spread of infection during induction of anesthesia or for involvement of the pleura by postoperative empyema. Even with improved anesthetic and surgical technique and the availability

*Chest Service, Lincoln Hospital and Beth David Hospital, New York, New York.

of potent antibiotics, it seems desirable that elective surgery such as pulmonary resection, be performed in an operative field that is as clean as possible. The indications for segmental postural drainage in the post-operative period following chest or abdominal surgery, may assume the nature of prophylaxis and/or therapy.

Principles

For postural drainage to be fully effective, four factors must be considered. First, bronchial patency must either be present, or must be established by bronchoscopy. Secondly, positioning of the patient must be individualized in accordance with our knowledge of the "segmental" localization of pulmonary disease and the direction of the draining tertiary bronchus. The widely held concept of inverting the patient for a few moments at a time is, for many areas of lung, as unsound anatomically as it is uncomfortable and at times impractical. Thirdly, postural drainage, for the sick patient who is confined to bed, must be predicated on as near a 24 hour basis as possible. The positions used must, therefore, be as comfortable as they can, yet anatomically correct. Fourthly, postural drainage must be coordinated with the use of such medications as have proved their ability to combat infection, influence bronchial secretions and help control any element of bronchospasm.

Method

The positions recommended by the writer for segmental postural drainage are shown in Figures 1, 2 and 3. They are based neither on the surface anatomy of the diseased bronchopulmonary segments nor on their x-ray projection, but rather on the direction of their draining tertiary bronchi. These recommendations differ from those first suggested by Singer in 1922[6] and by Nelson in 1933[5] in that they require no special bed or other mechanical facilities and they are readily tolerated by the patient.

Table I summarizes in outline form the positions used in applying postural drainage to each specific bronchopulmonary segment. The position to be specifically avoided, because it favors retention of secretions, is also indicated. Reference to Figures 1, 2 and 3 in conjunction with the outline in Table I makes clear the methods or positions to be used for segmental postural drainage in the treatment of pulmonary disease.

In a round-the-clock program of postural drainage, the "alternate" positions not only allow the patient some changes in posture, but offer a substitute whenever circumstances such as recent surgery, trauma or cardiac complications preclude the use of the "preferred" position or make its sustained application undesirable. It must be recognized however, that the "alternate" position in some instances is a poor substitute.

The concept of continuous postural drainage, whether prophylactic or therapeutic, would be incomplete without careful consideration of the positions "to be avoided." The "preferred" posture is intended to elevate the segment of lung to be drained and bring its bronchus into as close to a vertical position as possible. The posture "to be avoided" is the reverse

of the one to be "preferred," in that the segment involved by disease would remain in a dependent position with relationship to its tertiary bronchus and thus favor retention of the infectious elements.

A low pillow is shown under the patient's head in Figure 1. Unless essential to comfort, it is best eliminated. The positions illustrated in Figure 2 are similar to those in Figure 1, except that the pillow is under the patient's pelvis, for the purpose of elevating the lower trunk. This effect is best attained by use of a rather full, high pillow or one which is doubled

TABLE I: POSITIONS FOR SEGMENTAL PULMONARY DRAINAGE

	Bronchopulmonary Segment	*Preferred Position*
	Right Upper Lobe	
1.	posterior segment	1B. left anterior oblique
2.	anterior segment	1D left recumbent oblique
3.	apical segment	3B upright
4.	axillary subsegments	1C left side
	Right Middle Lobe	
5.	median segment	2E on back (p.u.p)**
6.	lateral segment	2D left recumbent oblique (p.u.p.)
	Right Lower Lobe	
7.	apical segment	1A flat on abdomen
8.	subapical segment	1A flat on abdomen
9.	anterior basal segment	2D left recumbent oblique (p.u.p.)
10.	median basal segment	2D left recumbent oblique (p.u.p.)
11.	lateral basal segment	2C left side (p.u.p.)
12.	posterior basal segment	2A on abdomen (p.u.p.)
	Left Upper Lobe	
13.	apical posterior segment	3C prop high on right side
14.	anterior segment	1F right recumbent oblique
15.	superior segment	2F right recumbent oblique (p.u.p.)
16.	inferior segment	2E right recumbent oblique (p.u.p.)
	Left Lower Lobe	
17.	apical segment	1A flat on abdomen
18.	subapical segment	1A flat on abdomen
19.	anterior basal segment	2F right recumbent oblique (p.u.p.)
20.	lateral basal segment	2G right lateral recumbent (p.u.p.)
21.	posterior basal segment	2A flat on abdomen (p.u.p.)

*Alternate position is usually a poor second choice.

under the patient. As an alternative, the foot of the bed may be elevated several inches. This latter maneuver has the disadvantage of causing the patient to slide against the headboard of the bed.

Adjuvants

The properly integrated application of segmental postural drainage, requires consideration of every useful adjuvant of physiological or pharmacological nature. One of the most important of these is deep breathing.

TABLE I (Continued)

*Alternate Position**	*Position to Avoid*
1A flat on abdomen	1E flat on back
1E flat on back	1A on abdomen
3A prop high on left side	1G right side
1B left anterior oblique, or	1G right side
1D left posterior oblique (depending on origin of subsegment)	
1E flat on back	1A on abdomen (or upright and forward)
2E flat on back (p.u.p.)	1A on abdomen (or upright and forward)
1B left anterior oblique	1E on back
1B left anterior oblique	1E on back
2C left side (p.u.p.)	1F, G, or H (or upright)
2C left side (p.u.p.)	1F, G, or H (or upright)
2D left recumbent oblique (p.u.p.)	1F, G, or H (or upright)
2B left anterior oblique (p.u.p.)	1E flat on back
3B upright	1B, C, or D on left side
1E flat on back	1A on abdomen
2E flat on back (p.u.p.)	1B, C, or D on left side
2F flat on back (p.u.p.)	1B, C, or D on left side
1B left anterior oblique	1E on back
1B left anterior oblique	1E on back
2G right lateral recumbent (p.u.p.)	1B, C, or D on left side
2F right recumbent oblique (p.u.p.)	1B, C, or D on left side
2H right anterior oblique (p.u.p.)	1E on back

**Pillow under the pelvis.

which, in the form of periodic exercises consciously performed in the recommended positions, takes advantage of bronchial physiodynamics. The bronchi dilate and elongate during inspiration, to a degree which is proportional to the local expansion of lung. With deep inspiration therefore, air may bypass secretions which otherwise obstruct a bronchus during ordinary respiration.

Slow deep breathing, by encouraging access of air to the peripheral bronchi, aids bronchopulmonary drainage in three ways. First, by equalizing intrabronchial and atmospheric pressures, it eliminates the suction influence of the negative intrathoracic pressure, and permits secretions to flow more rapidly from the smaller branches of the bronchial tree. Secondly, by gaining access to the peripheral bronchi, air acts as a displacing agent for secretions and inflammatory exudates. Thirdly, such air in the peripheral bronchi becomes the local expulsive medium without which the cough mechanism is almost useless.



FIGURE 1A FIGURE 1B FIGURE 1C



FIGURE 1D FIGURE 1E FIGURE 1F

Cough is the most important mechanism by which the bronchial tree is cleansed and the pulmonary parenchyma protected against infection, obstruction and resultant anoxia. However, excessive cough irritates the tracheobronchial tree and sustained coughing spells interfere with reaccumulation of air in the peripheral bronchi and air spaces. With a decrease in its expulsive agent, namely air, the expulsive force of the cough becomes progressively less effective. Under such circumstances, instead of being productive and useful, coughing leads only to exhaustion. The intent should be to make the cough more efficient through its control, rather than to depress it severely and interfere with its bronchial cleansing action. For this purpose Hydocan or codeine may be used in suitable dosage.

Antispasmodics must be given consideration as adjuvants to bronchial drainage because bronchospasm frequently complicates conditions associated with a cough. Whether it results from the mechanical irritation of excessive cough or the irritation of infected secretions, bronchospasm



FIGURE 1G FIGURE 1H



FIGURE 2A FIGURE 2B FIGURE 2C

interferes with free access of air to the peripheral lung parenchyma and with displacement of secretions from the bronchioles and bronchi. Bronchospasm can therefore become a dominant factor in perpetuating a vicious cycle of respiratory distress and infectual nonproductive cough. Although its use is attended with some drying of the mucous membranes, ephedrine is strongly indicated for the control of any element of bronchospasm. The writer has not only found ephedrine more effective for this purpose than the newer antihistaminic drugs, but in combination with theophyllin and small amounts of barbiturate, it often exhibits more influence on excessive cough than do sedatives such as codeine. The pharmacological implications of these observations clearly indicate the importance of bronchospasm in many of the conditions associated with excessive cough.

Another important aid to bronchial drainage is the use of expectorants.



FIGURE 2D FIGURE 2E FIGURE 2F



FIGURE 2G FIGURE 2H

The obvious advantages of thinning tenacious secretions or those with a tendency towards inspissation, needs no comment. For promoting free drainage of the bronchi, potassium iodide appears to be the most effective drug. Ammonium chloride should be considered as a second choice, only when there is intolerance to potassium iodide. In doses adequate to produce expectoration, the latter has the disadvantage of favoring acidosis and may prove undesirable under certain circumstances.

When it is suspected that obstruction of a bronchus may be due to an underlying neoplasm or to the presence of an aspirated foreign body, prompt recourse to bronchoscopy is indicated. When spontaneous bronchial drainage is delayed for 48-72 hours, bronchoscopy is also advisable, both for diagnostic reasons and for the purpose of establishing such drainage.

The use of antibiotics has been the prime factor in increasing the number of cases of suppurative lung disease cured by medical treatment. This is particularly true of those antibiotics having a broad bacterial range of activity, since many of the suppurative lung conditions are accompanied by mixed infections. Used in conjunction with segmental pulmonary drainage and the other adjuvants described above, increasing numbers of the acute and subacute cases of suppurative lung disease should prove curable without surgical intervention. Those chronic and recurrent infections which are not amenable to surgery because of the extensiveness of their involvement or because of the patient's general condition, should prove more subject to medical control. When possible and if necessary by direct aspiration through the bronchoscope, a culture of the bacterial invaders should be obtained as a basis for selection of the antibiotics. For the mixed infections which commonly occur in cases of lung abscess and bronchiectasis, the writer has found chloromycetin to be the most readily tolerated.*

*Since this article was first written, attention has been called to the possibility of bone marrow depression associated with the use of chloromycetin. For the present, this must be considered when choosing antibiotics.

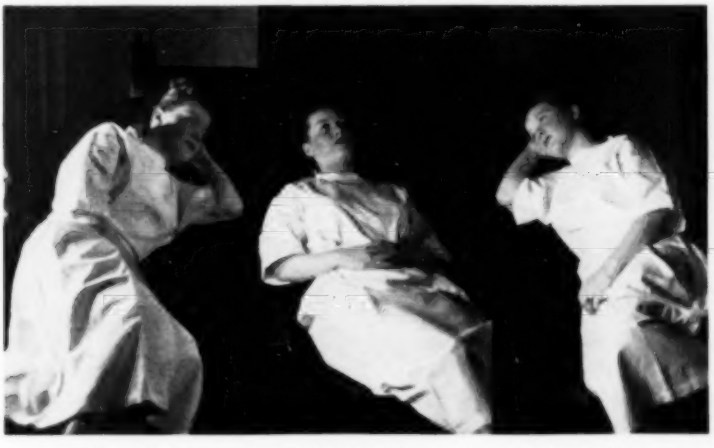


FIGURE 3A FIGURE 3B FIGURE 3C

However, in some cases, terramycin, aureomycin, streptomycin, penicillin or even their combination with sulpha drugs, may prove necessary.

Evaluation

In a program of continuous postural drainage, sudden or profuse expectoration is not to be expected and should therefore not be considered a criterion for its success. There is, instead, a continuous elimination of small amounts of secretion as a result of such round-the-clock drainage. Many people, even under careful instruction, find it impossible to expectorate their bronchopulmonary secretions and continue to swallow them. The measurement of such material is therefore not always representative of the amount raised. Evaluation of the success of postural drainage can only be based on decrease in toxicity of the patient, decrease in frequency and severity of his cough and decrease in the size of the roentgenographic shadow or of its fluid level, when such is present.

Prophylactic Applications

Although this presentation is primarily concerned with the therapeutic use of postural drainage, a brief review of some of its prophylactic applications appears warranted. In the presence of severe debility or conditions associated with a state of lowered consciousness, such as shock, stupor, coma and narcosis, gravity seriously influences the accumulation of secretions in the bronchi and lung. It is the purpose of prophylactic postural drainage to prevent such secretions or infectious material from remaining in one area long enough to favor atelectasis, "drowned lung," bronchogenic spread of infection, or the complicating local and systemic effects of decreased oxygen diffusion. Except as determined by individual limitations, the prophylactic application of postural drainage requires rolling or turning the patient in bed, at frequent, regular intervals, and encouraging deep breathing. Intermittent positive pressure oxygen for aeration of the pulmonary parenchyma, is a useful substitute for deep breathing exercises in states of lowered consciousness. The adjuvants to postural drainage described above are also important in a prophylactic program of treatment.

In addition to the common practice of placing the newborn baby in the Trendelenburg position and applying catheter suction to the nasopharyugeal passages, it would be advisable to turn the infant frequently during the first two or three hours after delivery.

SUMMARY

A revision is suggested in our concept of postural drainage for pulmonary disease. Recommendations are made for a more continuous application of its principles to the specific bronchopulmonary segments involved by such suppurative disease as lung abscess and bronchiectasis. The positions selected for segmental postural drainage are applicable to most bedridden and debilitated individuals, since they impose no strain or fatigue and require no special bed or apparatus. The co-ordination of postural drainage with other measures, such as bronchoscopy, cough sedatives, antispas-

modics, expectorants and antibiotics is discussed. Some of the medical, surgical and pediatric indications for segmental postural drainage are reviewed. Attention is also directed to its prophylactic aspects.

RESUMEN

Se sugiere que se enmiende nuestro concepto de la canalización postural en las enfermedades pulmonares. Se recomienda que se apliquen sus principios en forma más continua a los específicos segmentos broncopulmonares afectados por enfermedades supuradas, tales como el absceso pulmonar y la bronquiectasis. Las posiciones que se han escogido para la canalización postural segmentaria son aplicables a la mayoría de los pacientes encamados y debilitados, ya que no causan esfuerzo ni fatiga y no requieren camas o aparatos especiales. Se discute la coordinación de la canalización postural con otras medidas, tales como la broncoscopia, sedantes para la tos, antiespasmódicos, expectorantes y antibióticos. Se repasan algunas de las indicaciones médicas, quirúrgicas y pediátricas para la canalización postural segmentaria. También se llama la atención a los usos profilácticos de la canalización postural.

RESUME

L'auteur propose de reconsidérer notre conception du drainage de posture pour les affections pulmonaires. Il recommande que l'on applique d'une façon systématique les principes du drainage en fonction du segment broncho-pulmonaire atteint par la suppuration, soit abcès du poumon, soit bronchiectasies. Les positions nécessaires pour le drainage de posture d'un segment peuvent être appliquées aux individus confinés au lit et les plus fatigués. Elles n'exigent en effet ni chocs, ni fatigue, et ne demandent ni lit ni appareil spéciaux. L'auteur pose la question de l'association du drainage de posture avec d'autres moyens, tels que bronchoscopies, sédatifs de la toux, anti-spasmodiques expectorants, et antibiotiques. Il passe en revue quelques-unes des indications médicales et chirurgicales du drainage de posture segmentire, et celles qui sont propres aux enfants. En outre, il attire l'attention sur l'utilisation prophylactique de cette méthode de traitement.

REFERENCES

1 Adams, R. and Davenport, L. F.: "Technique of Bronchography and System of Bronchial Nomenclature," *J.A.M.A.*, 118:111, 1942.
2 Brock, R. C.: "The Anatomy of the Bronchial Tree," Oxford University, 1947.
3 Felson, B. and Felson, H. P.: "Localization of Intrathoracic Lesions by Means of the Postero-Anterior Roentgenogram," *Radiol.*, 55:363, 1950.
4 Jackson, C. L. and Huber, J. F.: "Correlated Applied Anatomy of Bronchial Tree and Lungs with System of Nomenclature," *Dis. of Chest*, 9:319, 1943.
5 Kane, I. J.: "Segmental Localization of Pulmonary Disease," *Radiol.*, 59:229, 1952.
6 Nelson, H. P.: "Segmental Drainage of Lungs," *Brit. M. J.*, 2:251, 1934.
7 Singer, J. J. and Graham, E. A.: "The Newer Treatments of Bronchiectasis," *Jour. M. A.*, 19:390, 1922.
8 Temple, H. L. and Evans, J. A.: "The Bronchopulmonary Segments," *Am. Jour. Roentg. and Rad. Therapy*, 63:26, 1950.

One Stage Thoracoplasty Using an Adhesive Hemicast

W. G. TRAPP, M.D., F.C.C.P.*
Vancouver, B. C., Canada

The day of routine single stage thoracoplasties has been brought nearer with the control of shock by using adequate blood replacement and with the control of respiration during operation by a tracheal intubation and the use of curare. Laird and Lindenfield presented a series of 72 single stage thoracoplasties in 1950 to the American Association for Thoracic Surgery. These operations were done on selected patients. Contrary to Laird's finding that the control of paradoxical respiration did not present a problem, we have found that even normal three rib operations are occasionally marked by noticeable respiratory embarrassment caused by paradoxical respiration. We have attempted to solve this problem by developing an adhesive hemicast for the thoracic cage, the use of which we have been investigating under varying circumstances. We are now convinced, so far as the immediate post-operative period is concerned, that if the patient is a good enough risk for any type of pulmonary resection he is also a satisfactory risk for almost any degree of one stage thoracoplasty. As a final estimate of the effectiveness of this procedure can only be made over a period of several months post-operative study, the present paper is presented as a preliminary report.

The requirements to be met by such an aid as a half cast to the chest wall are many.

1) It must be effective in preventing paradoxical respiration.
2) It must allow effective use of the contralateral side.
3) It must allow satisfactory clearing of the bronchial secretions on both sides.
4) It must be sufficiently flexible to allow enough movement of the shoulder to prevent fixation of the scapula to the chest wall.
5) It must be easy to apply, and it must be applicable to many different types of thoraces—fat, thin, full breasted, etc.

Finally, it must not interfere with the healing of the wound and must be easily removable.

During the period, February to June 1951, 17 patients undergoing thoracoplasty at Tranquille Sanatorium have been routinely subjected to the following procedure. The anaesthetic is administered via tracheal intubation which is performed using sodium pentothal and curare. An ordinary first stage thoracoplasty is then performed removing the third rib first, then the second and finally the first rib. The ribs are removed with their transverse processes and their cartilages in the case of the first three. Half the cartilage of the fourth rib is also removed with the fourth rib

*From Tranquille Sanatorium, British Columbia, Canada.
Read at Northwest Pacific Chapter, American College of Chest Physicians, Portland, Oregon, November 1 and 2, 1951.

so that a normal anterior stage is done. From the third rib on down the ribs and transverse processes are removed seriatum so the operation can be discontinued at any point without changing the approach that would be necessary later if further operation were indicated. In only two cases, both Japanese females, one of 58 years, was it necessary to discontinue operation after complete removal of five ribs because of surgical shock. One of these women had a normal lower stage operation three weeks later without incident.

When the desired number of ribs have been removed the wound is closed in layers using interrupted cotton for the muscles and fascia and Dermol for the skin. Whitehead's varnish is applied to the incision which is then covered with a strip of gauze one inch wide. This is painted with Mastisol and covered with another strip two inches wide. With the patient still lying on the operating table and still intubated, the entire chest is painted with tincture of Benzoin which is allowed to become tacky. The chest is then wrapped around with Elastoplast bandage which is laid on without tension. The overlap on the bandage, because this is the weakest part of the dressing, is kept less than one quarter inch. Six inch plaster bandages are then applied to the chest over the operative side as shown in the photographs (Figures 1-10). Care is taken to keep the plaster low in the axilla so that the shoulder is not raised uncomfortably and plaster is kept high in the infraclavicular area to prevent the paradoxical respiratory movement that is usually most marked in this space. The plaster must be wet and well rubbed into the mesh of the adhesive for good anchorage. The bandage extends from the spine posteriorly to the opposite side of the sternum anteriorly because the relatively fixed skin over these structures assists greatly in stabelizing the cast. As a rule three six inch plaster bandages are used with the plaster thickest in the axillar and infraclavicular areas. The edges of the plaster are kept thin so they will be slightly springy and will not provide a fixed point from which the adhesive may begin to strip from the skin. Pressure is applied with the hands to keep the collapse maximal while the plaster is setting. The patient is brought out of the anaesthetic at this time. The shoulder and the clavicle are kept sufficiently free from the plaster to allow enough scapular movement to prevent adherence of the scapula to the chest wall.

We have found at the end of 10 days when the plaster is removed, that the bandage is usually well fixed to the chest wall. In case of premature separation the bandage is removed locally and the adhesive and plaster are reapplied. This has seldom been necessary. Skin sutures are removed in 10 days by which time the chest wall has stiffened enough so that an ordinary chest binder over the wound dressing is all that is necessary. At this time also evidence of wound exudate deep under the muscles is looked for and if present removed with a moderately large bore aspirating needle. This has been necessary in less than a fifth of cases.

During the period, February to June 1951, thoracoplasty patients in this institution were routinely subjected to this operative approach and the following observations have been made.

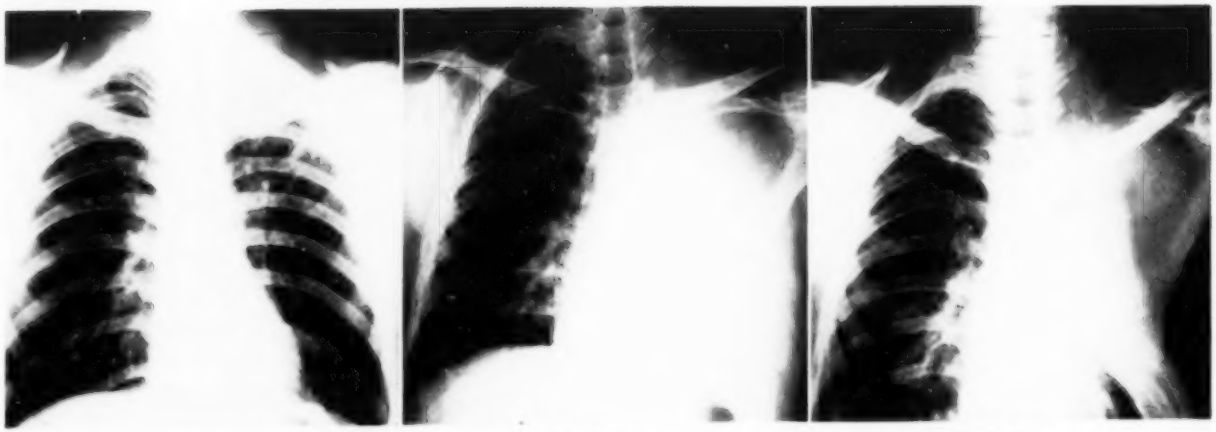


FIGURE 1 FIGURE 2 FIGURE 3

Figure 1: Preoperative x-ray film.
Figure 2: Two weeks postoperatively showing fairly heavy wound exudate shadow.
Figure 3: Showing absorption of exudate five weeks post operatively.



FIGURE 4



FIGURE 5



FIGURE 6

Figure 4: Mastisol dressing.
Figure 5: Anterior aspect application of elastoplast.
Figure 6: Posterior aspect application of elastoplast.



FIGURE 7 FIGURE 8 FIGURE 9

Figure 7: Posterior aspect of cast 48 hours postoperatively.
Figure 8: Anterior aspect 48 hours postoperatively.
Figure 9: Prior to removal of sutures nine days postoperatively.

1) There has been no difficulty controlling post-operative paradoxical respiration. Post-operative respiration, because of the protective splinting action on the injured side has been effectively carried out—on some cases more comfortably after a seven rib removal with a cast, than with a conventional three rib removal. It has been found advantageous to keep the cast relatively thin so that movement of the opposite side may be facilitated by a slight springing of the cast with the normal forward movement of the sternum accompanying respiration.

2) In only one case was there any real difficulty in raising sputum post-operatively, and this disappeared in three days. Further support is given to the impression that sputum is cleared adequately by the fact that there were no post-operative spreads with the possible exception of one patient who had also formed a rather large amount of post-operative exudate. He had an elevated temperature for a longer period than we were accustomed to seeing so gave streptomycin. The exudate, or infiltrate, whichever it was, cleared very quickly. It was our impression that it cleared too quickly for it to have been tuberculous infiltration.

3) Shoulder function has not been interfered with in any case and all the patients have been able to touch their hands above their heads with their arms fully extended following removal of the cast.

4) There has been little difficulty adapting the cast to various types of physique; an emaciated male, age 27, a very muscular and obese male age 50 from whom 50 inches of rib were removed in one operation and a medium sized female with large breasts reacted well to this technique.

5) The aspiration of post-operative fluid in the pleural space has been easily managed by cutting a hole in the cast posteriorly and using a needle.

6) Removal of the cast after a 10 day period has not presented any difficulty. The skin is usually well stuck but is stripped fairly easily as the cast is sprung from the midline anteriorly and posteriorly.

7) One of the most remarkable and pleasing things about this procedure has been the excellent healing of the wound under the protection of the cast which reduces the tension in the skin to a minimum. This satisfactory healing is found even in cases where there is considerable wound exudate in the layer between the muscles of the shoulder girdle and the decostalized chest wall. In one instance only where 1,000 cc. sero-sanguinous wound exudate was aspirated (after the cast had been removed 10 days post-operatively) was there a slight separation of the lower wound edges. Satisfactory wound healing occurred within a few days of aspiration.

8) In one case with a completely fused pleural space the fluid collected over the left side of the heart with sufficient pressure in our opinion to effectively tamponade the cardiac action. In this instance, our only fatality, death occurred 52 hours post-operatively. Post-mortem examination, which was carried out immediately, was very interesting. This patient was a 42 year old female in excellent general condition. The previously described seven rib thoracoplasty was carried out in one stage and a plaster applied. The condition of the patient was quite satisfactory until 36 hours after

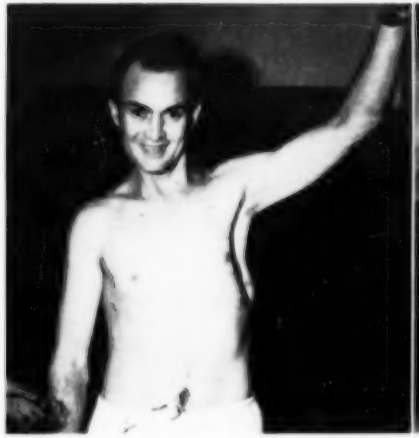


FIGURE 10 (Mr. D)



FIGURE 11 (Mr. J.)



FIGURE 12 (Mr. J.)

Figure 10: Removal of cast nine days postoperatively.
Figure 11: Preoperative x-ray film.
Figure 12: Planogram cavity left apex.

the operation, when the patient began to complain of slight breathlessness with tightness of the chest. As we suspected a pleural tear with some effusion we made an attempt to aspirate the pleural space which could not be found. The following day a hole was cut in the plaster posteriorly and an attempt was made to aspirate the wound. This was also unsuccessful. It was noted that when the patient was turned on her right side to facilitate aspiration of the fluid from a direct anterolateral approach to the wound she became quite cyanosed. There was relief of the cyanosis and also of a feeling of discomfort when the patient was turned back so that the operative side was dependent. This led us to suspect that there was a pressure effect from the weight of the fluid in the wound space. This was believed to be causing a cardiac compression which was relieved when the fluid was put in a dependent position. However, attempts to aspirate fluid directly over the space were ineffective at this time and it was decided to explore the possibility that the change in position either by a mechanical distortion of the air tubes or the extrusion of intrabronchial exudate from the collapsed lung were causing the interference with oxygenation of the blood. It was noted that there were none of the usual signs of tracheal blocks such as marked inspiratory effort, cough, etc., except for the marked cyanosis and a sensation of pressure in the chest. Bronchoscopy was carried out immediately as the condition of the patient had deteriorated suddenly and she became unconscious. The bronchial tree was found to be clear of secretions—a further evidence that clearing of secretions from the respiratory tree is effective. The patient was then stripped of her plaster dressing to allow free and easy exposure to the anterolateral chest wall for a further attempt at aspirating the wound. At this point the heart stopped and all attempts at resuscitation were unsuccessful.

At immediate post-mortem were found: a) 450 cc. sero-sanguineous fluid between the shoulder girdle muscles and the chest wall; b) fused pleural space; c) fixed mediastinum. The negative bronchoscopic findings were confirmed and our impression that coughing is effective even with a fixed hemithorax was reinforced. Unhappily, however, from a statistical point, this death in such a small series was disastrous. Because of its obviously preventable nature and the information gained by the post-mortem examination, the accident was not felt to preclude further use of this method.

9) As in staged thoracoplasties, streptomycin has not been routinely used, but I am inclining to the view that in this procedure it would be of value.

10) There is also a saving in blood. An average of 1,500 cc. per large single stage is used instead of 1,000 cc. for a first stage and 500 cc. for each additional stage, or about 2,000 to 2,500 cc. total.

As the months of post-operative observation increase we are becoming impressed with other less obvious things:

11) In the case of one patient with an apical cavity and a very fibrotic lesion a seven rib single stage thoracoplasty was done. We now think that

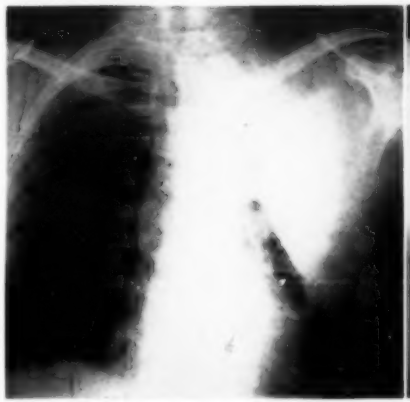


FIGURE 13 (Mr. J.)

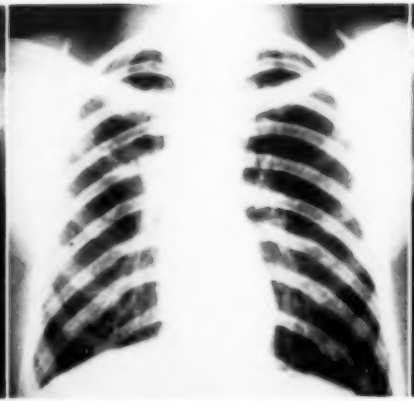


FIGURE 14 (Mr. H.)

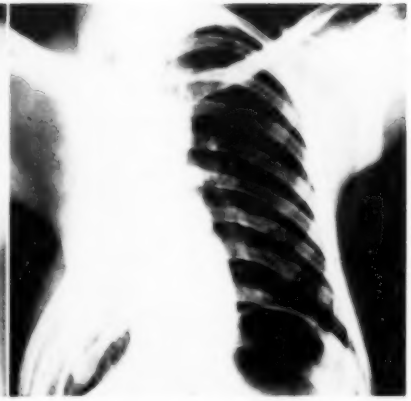


FIGURE 15 (Mr. H.)

Figure 13: Seven weeks postoperatively.
Figure 14: Preoperative x-ray film.
Figure 15: Seven weeks postoperatively.

it would have been reasonable to expect a cavity closure by the single stage technique removing only five ribs (Mr. J.).

12) Another patient with a cavity and parahilar infiltration got an effectual collapse from a seven rib one stage operation which we do not think would have been the case if the staged procedure had been used (Mr. H.).

Patients are extremely grateful to escape the long wearing-down process of repeated major operations. In this institution 3.04 operations per patient have been used over the past three years so that the adoption of the present procedure saves more than two operations per patient.

The ordinary three stage procedure takes about six weeks so that the adoption of the single stage technique means a saving in hospitalization during the operative period of six weeks, not to mention the fact that final convalescence is greatly shortened, at least by an additional month.

Acknowledgments: Any major change in a surgical programme is brought about by the efforts of many people who must be nameless if only for lack of space. The re-arrangement occasioned by the adoption of the present technique has required a good deal of cooperation from the staff of Tranquille Sanatorium. I am very grateful to the medical superintendent, Dr. H. S. Stalker, and to the members of his staff for the spirit in which this cooperation has been given. I am also grateful to Dr. I. G. Smillie of the Burris Clinic, Kamloops, without whose excellent anaesthesia this project would never have been undertaken.

SUMMARY

1) Paradoxical post-operative respiration has been controlled using an adhesive hemicast.
2) Sputum has been adequately cleared.
3) The technique has been successfully applied under varied circumstances.
4) There has been good wound healing under the cast.
5) The collapse obtained appears to be more complete than when an equal number of ribs are removed by the staged procedure.
6) Patients are enthusiastic about the prospect of a one stage alternative.
7) Two operations and two and one-half months hospitalization are saved.

RESUMEN

1) La respiración paradójica post-operatoria ha sido controlada usando un molde adhesivo.
2) El esputo ha sido adecuadamente negativizado.
3) La técnica ha sido satisfactoriamente aplicada bajo variadas circunstancias.
4) Ha habido buena cicatrización debajo del corsé adhesivo.
5) El colapso obtenido parece ser más completo que cuando se quitan igual número de costillas, mediante el procedimiento escalonado.
6) Los pacientes se entusiasman con la perspectiva de una intervención en un tiempo.
7) Se ahorran dos operaciones y dos y medio meses de hospitalización.

RESUME

1) L'auteur a lutté contre la respiration paradoxale post-opératoire par l'utilisation d'un plâtre et par la thoracoplastie en un temps.
2) L'expectoration s'est trouvée éclaircie.
3) La technique a été utilisée avec succès dans différentes circonstances.
4) De nombreuses lésions se sont trouvées guéries sous le plâtre.
5) Le collapsus obtenu apparait plus complet que lorsqu'on enlève un nombre équivalent de côtes en plusieurs temps.
6) Les malades sont très satisfaits à l'idée d'une intervention en un temps.
7) Ainsi se trouvent économisés deux temps opératories et deux mois et demi d'hospitalisation.

The Mechanism of Healing of Lung Cavities

HALIM A. ZAKI, M.R.C.P. (Edin.), T.D.D. (Wales)* and A. RIDA, M.D.**
Alexandria, Egypt

Air vesicles of the lung, once inflated at birth, remain so for the rest of life, unless deflated by other factors. The state of inflation and the attendant bellowing action of respiration are maintained by various opposite mechanisms. The lungs are anchored by their roots to both sides of the mediastinum in a median central plane, and adherent to the thoracic wall and the diaphragm in lateral and inferior planes. That little moisture which exists between the visceral and parietal pleurae is of immense physical and mechanical importance. It allows the two surfaces to glide smoothly one against the other and at the same time to bind them so firmly together as if they are one sheet by surface tension cohesion.

The essential framework of the lung upon which depends its mechanical function, is composed of the all-important elastic tissue. Elasticity is a property by which a material conserves the energy that is expended in altering its shape and which it uses back practically without loss in regaining its original form once the applied force has been released. In other words, if we apply this to the physical act of respiration, we find that the energy exerted in inspiration is utilised to perform expiration by the recoil of the elastic lung. It is assumed, therefore, that there is an uninterrupted line of elastic pull running from the mediastinum as a fixed central point to both pleurae one on each side of the chest to counterpoise each other. If, however, the lung is severed in any plane the cut surfaces would be pulled away from the line of interruption towards the fixed points; in this case, in two directions: (a) the mediastinum, and (b) the lateral pleura. In other words, the forces that operate to keep the wound gaping will be necessarily "centrifugal"; i.e., away from its center; therefore before any closure of the wound can take place the above forces must be overcome and the direction of the pull reversed, i.e. centripetal.

A wound in human tissue heals from the inside by healthy granulation tissue that throws delicate scaffolding on the adjacent surfaces and firm binding is achieved by the development of fibrous tissue knitting the opposite surfaces together. A cavity is a cleavage in the third dimension. In the lung, it will suffer the effects of the previously described "centrifugal" pull of the elastic matrix in all directions, thereby giving it a spherical volume. The surfaces of a cavity so held cannot be approximated except by either:

(A) A very slow and laborious knitting of the edges and bringing in continuity the severed elastic tissue from the periphery inwards, i.e. in concentric layers; thereby overcoming the pull, in which case the center

*Professor, Diseases of the Chest, Faculty of Medicine, Alexandria University, Alexandria, Egypt.
**Lecturer, Diseases of the Chest.

of the cavity is the last to disappear; or by (B) dislodging one of the components of the centrifugal pull, e.g. the pleura, as by pneumothorax, thereby eliminating or diminishing the third dimension. Whichever of these above mechanisms is brought into play first, alone, or together, a cavity will not loose its initial volume or heal by granulation fibrous tissue if:

(a) There is more air that enters during inspiration than can escape during expiration; (b) Septic secretions of the cavity accumulate and prevent the surfaces from approximation; (c) The granulation tissue is destroyed as soon as it is formed; and (d) The pericavitary zone is so diseased or cut off from a sufficient blood supply to permit the regeneration of healthy granulation tissue.

We may proceed to examine each in turn, although some or all of them may operate conjointly or successively to the detriment of the healing process.

(A) *Air Content:*

A cavity contains air by virtue of its communication with a bronchus. Normally a bronchus elongates and widens during inspiration and retracts and narrows during expiration leaving a normal residual intra-alveolar pressure. A feeding bronchus of a cavity may be structurally stenosed by a tumour, specific granulation, scarring or by inflammatory congestion and oedema; or when its normal anatomical axis is distorted by neighbouring traction-fibrosis causing it to kink during expiration. Under these conditions air will be trapped during expiration, since inspiration is the more positive and forcible act; the result is ballooning or tension cavity. According to recent bronchoscopic and pathologic data, a large percentage of tuberculous lung cavities have some form of bronchial pathology. This information is highly significant and it seems to us from our experience that all tuberculous cavities of three centimeters and over in diameter and many of the smaller chronic ones fall under this description. We agree with Monaldi who was the first to point out that the so-called radiological "fibrosed" wall of a cavity is very often a condensed lung tissue compressed by raised intracavitary pressure. Sometimes the positive pressure inside a cavity is responsible for unexplained dyspnoea, that is relieved after cavity drainage. Presumably the phenomenon is due to disturbed Hering-Bruer mechanism. In case a bronchus is fully occluded, Corylios phenomenon of cavity collapse by absorption of its air content takes place, and the cavity disappears, though the edges may be separated by inspissated caseous material that undergoes gradual organization by invasion of granulation tissue. Sometimes cavities remain practically of the same size for years while the patient is in good condition and usually with negative sputum. It is to be assumed that re-epithelialisation has taken place, a fortunate event though of seldom occurrence.

(B) *Fluid Content:*

The secretions that accumulate in a cavity are formed in its wall from the inside in response to pathogenic organisms. These are usually aerobes

with superadded anaerobes in cases of putrid abscesses; Koch's Bacilli, singly or with other aerobes in cases of tuberculous cavities. The presence of highly septic material in the case of acute abscess and many of the chronic ones, contributes in no small measure to the acute inflammation and obstructive oedema of the feeding bronchus thus interfering with useful drainage. In 1945 we had experience with local instillation by transpulmonary route of solitary acute lung abscess (first practiced by one of us, H.Z., in 1945) by penicillin and later by penicillin and streptomycin according to the identification of aspirated organisms. The fetor disappeared in one or two days and the secretions became thin, much less abundant and clearer at the same time. Such a dramatic response was not before achieved by any other method hitherto employed. The bacterial flora received a massive blow whether aerobes or anaerobes, that a culture from the cavity was often sterile in a few days. The cavity lining is rendered clean and healthy. The lining granulation-fibrous tissue gradually contracted the cavity centripetally and was seen to diminish in size from the periphery inwards. The state of affairs in a tuberculous cavity, however, is quite different since the tubercle bacillus, though a strict aerobe, does not lend itself so readily to the action of antibiotics, thanks to its fatty structure. It is as slow to grow as it is resistant to kill. The abvious choice in the indicated case is a fixed drain for more prolonged manipulation. This is based on a fixed catheter inside the cavity and will be described in another publication. We employ no suction but make use freely of antibiotic instillation. Chaulmougra oil, our latest addition for local instillation, has been found of definite value to diminish and cleanse the exudate. We had occasion to examine at autopsy two cavities thus treated. Their surfaces were clean and glistening. Upon histological examination, new epithelium was in formation on top of granulation-fibrous tissue layer. Our belief is that: cavernestomy is rarely an object in itself, but it is a salvage operation, sometimes when nothing else is of avail. A final plastic operation is often needed when the patient is made ready for it.

(C) *Inner Surface:*

The lining of a cavity is the mirror surface upon which is reflected the powers of healing and destruction. A healthy progressive granulation-fibrous healing is full evidence of the vigour of a good resistance and such healing often leaves the minimum of scarring and disorganization. The retention of virulent organisms would destroy the granulation tissue as soon as it is formed. Extension of an epithelial lining inside a dry cavity sometimes takes place when the inner surfaces are prevented from approximation by failure of the "centripetal" forces.

(D) *Cavity Wall:*

The pericavitary zone is the ground from which, by lymph and blood, all the essential elements of resistance are made. Pericavitary tuberculous infiltrations cause occlusion of the lymph and blood, as well as destroying the elastic matrix upon which the granulation-fibrous scaffolding most

depend to maintain continuity for the development of a "centripetal" pull. The transference of the battle ground from the inner surface to the wall would result in thick septic granulation tissue that hinders the inward pull. This is translated as dense, hard, fibrous shell, firmly fixed in its bed of organized lung tissue and distorted anatomical surroundings. Tomography in such cases may show pulling on various structures, i.e. the mediastinum, the interlobar fissure or the lateral chest wall; while the cavity is recognized at its correct depth encircled by a hard opacity in the serial radiographs. These cavities do not show disappearance of the annular condensation or quick reduction in size after cavity drainage and antibiotic instillation. Suction, according to Monaldi's technique, which in our opinion is one form of Bier's hyperaemia (a difficult biologic phenomenon to control); may or may not be of help. These cavities often have several feeding but distorted bronchi. The ideal treatment is resection; though thoracoplasty may be successful in some.

SUMMARY

1) The factors that hold a cavity patent in the lung are discussed.

2) The reversal of the elastic pull to centripetal from centrifugal is discussed as necessary requisite for cavity closure.

3) Conclusions are drawn on the behavior of cavity healing based on our experience with: (a) Transpulmonary injection of antibiotics of lung abscesses. (b) Catheter fixation in tuberculous cavities and instillation of antibiotics and oil of chaulmougra.

RESUMEN

1) Se discuten los factores que mantienen abierta una cavidad en el pulmón.

2) La inversión de la tracción elástica de la forma centrípeta a la centrífuga se discute como requisito necesario para el cierre de la cavidad.

3) Se sacan conclusiones sobre la conducta de la curación de las cavidades basadas en nuestra experiencia con: (a) Inyección transpulmonar de antibióticos en abscesos pulmonares. (b) Fijación de catéteres en la cavernas tuberculosas e instilación de antibióticos y de aceite de chaulmugra.

RESUME

1) L'auteur décrit les facteurs qui sont responsables de la persistance d'une cavité dans le poumon.

2) Il montre que la réversibilité de la tension élastique qui, de centripète devient centrifuge, est nécessaire pour fermer la cavité.

3) Il conclut en se basant sur le comportement des cavités traitées: (a) dans le cas d'abcès du poumon, par des injections transpulmonaires d'antibiotiques, (b) par des aspirations par la sonde dans les cavités tuberculeuses, avec instillations d'antibiotiques et d'huile de Chaulmoogra.

REFERENCES

1 Monaldi, V.: "Procedimento di Aspirazione endocavitaria delle caverne tubercolari del polmone," *Ann. Inst. Carlo Forlanini*, 10:665, 1938.

2 Monaldi, V.: "Uber die Saugdrainage der tuberculosen Lungen-Kavernen," *Munchen. Med. Wchnschr.*, 38:453, 1941.
3 Corylios, P. N.: "The Importance of Atelectasis in Pulmonary Tuberculosis," *Am. Rev. Tuberc.*, 28:1, 1933.
4 Corylios, P. N.: "How do Rest and Collapse Therapy Cure Pulmonary Tuberculosis," *J.A.M.A.*, 100:480, 1933.
5 Corylios, P. N.: "Mechanics and Biology of Tuberculous Cavities," *Am. Rev. Tuberc.*, 33:639, 1936.
6 Corylios, P. N. and Ornstein, G. G.: "Giant Tuberculous Cavities of the Lung," *J. Thor. Surg.*, 8:10, 1939.
7 Corylios, P. N.: "Pathologic Physiology of the Tuberculous Lung," Goldberg's Clinical Tuberculosis. Philadelphia.
8 Corylios, P. N.: "Surgical Treatment of Uncollapsed Large Tuberculous Cavity," *Quart. Bull., Sea View Hosp.*, 3:149, 1938.
9 Pagel, W. and Roberts, L.: "Behaviour of Cavities Under Pneumothorax Treatment," *Brit. M. J.*, 2:1258, 1938.
10 Pagel, W. and Simmonds, F. A. H.: "The Healing of Cavities," *Am. J. Med. Sc.*, 197:281, 1939.
11 Pagel, W. and Simmonds, F. A. H.: "Cavity Healing and Bronchial Occlusion," *Am. J. Med. Sc.*, 203:177, 1942.
12 Maurer: "Cavernostomy and Tamponade of Pulmonary Cavities with P.A.S.," *Dis. of Chest*, 16:676, 1949.
13 Sayes: "Bronchial Picture of Tuberculous Cavities," First International Chest Congress, Rome, Italy, 1950.

Sarcoidosis: Treatment with Cortisone, ACTH and Urethane

MICHAEL F. KOSZALKA, M.D. and ARTHUR C. FORTNEY, M.D.*
Fargo, North Dakota

Consistent results were not obtained from urethane, calciferol, nitrogen mustard and antibiotics in the treatment of sarcoidosis by Sones and his associates[1] but they recently reported marked improvement in two patients with sarcoidosis treated with cortisone. Association of functional adrenal impairment with sarcoidosis was suggested by their report. The dramatic regression observed in their two patients was not attributed to spontaneous regression and striking changes occurred in the biopsied tissues after treatment. On the other hand, Thorn and his co-workers[2] reported the use of ACTH without beneficial effect in one case of sarcoidosis.

Since no other effective or specific treatment for sarcoidosis is known, the results obtained from the use of all three drugs, cortisone, ACTH and urethane, in a patient with sarcoidosis is the occasion for the following report.

Case Report

A 32 year old white male, while enroute home from the Letterman General Hospital, was admitted to the Fargo Veterans Administration Hospital, August 1, 1950 because of sudden onset of paroxysmal cough, extreme dyspnea, vomiting and semicoma.

Present Illness: Upon reenlistment in the U. S. Army on May 12, 1948 he was stationed in California. He remained in good health until July 1949 when he was hospitalized because of a persistent cough productive of a greenish-white mucoid sputum associated with exertional dyspnea. In August 1950, biopsy of a parasternal lymph node established the diagnosis of sarcoidosis. A study of this slide showed round masses of epithelioid cells with occasional Langhans giant cells but no central necrosis (Figure 1). Several skin biopsies and a sternal marrow puncture were normal. During army hospitalization he required or received many therapeutic measures, such as penicillin, sulfadiazine, aureomycin, potassium iodide, oxygen, digitalis and mercurial diuretics. At one time he appeared terminal, was comatose for 10 days, and had two Jacksonian epileptiform seizures but rallied and gradually improved sufficiently to receive a medical discharge on July 29, 1950.

Past history and family history were non-essential and non-contributory.

Physical examination on admission revealed a 32 year old fairly well developed but poorly nourished white male who appeared acutely and chronically ill with dyspnea, cyanosis, weakness and paroxysms of coughing. Facial expression of fright and marked anxiety were exhibited. His lungs were filled with inspiratory and expiratory moist rales and wheezes. A systolic apical murmur was present. Examination of the slightly protuberant abdomen revealed enlarged liver four finger breadths below the right costal margin. His color was ashen gray and his

*From the Medical Service, Veterans Administration Hospital, Fargo, N. Dakota.
Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

skin bore multiple, discrete, superficial and deep self-induced excoriations. There was no superficial lymphadenopathy.

Laboratory Findings: Red blood cell count was 4,750,000 per cubic millimeter. Hemoglobin 13.8 grams (Sahli). White blood cell count was 9,900 per cubic millimeter with the differential count showing 68 per cent polymorphonuclear cells, 30 per cent lymphocytes and 2 per cent monocytes. The sedimentation rate was 8 mm. (Wintrobe method). Hematocrit 50-55 per cent. Urinalysis and blood Kahn tests were negative. The total protein was 7.32 mg. per cent with an albumin-globulin ratio of 2.08-5.4. CO_2 volume per cent: 46. Blood NPN: 35-54.6 mg. per cent. Blood calcium: 9.7 mg. per cent; inorganic phosphorus: 4.3 mg. per cent. Blood chlorides: 500 mg. per cent. Repeated sputum studies were negative for acid fast bacilli. Spinal fluid findings were normal. Tuberculin P.P.D. skin tests with 1st and 2nd test strengths were negative. A Thorn eosinophile test on August 18, 1950 demonstrated a drop in the eosinophil count from 110 to 36 eosinophiles per cubic millimeter, with a 9.2 per cent increase in the urine uric acid:creatinine ratio. Repeated at weekly intervals throughout the entire hospital stay, the patient's hematologic findings, CO_2 combining power, blood chlorides, NPN and urinalyses remained within the limits of normal except for the appearance of albuminuria during the latter half of his hospital course. The electrocardiogram showed the characteristic findings of right ventricular hypertrophy. X-ray films of the hands and feet were negative. X-ray films of the chest showed enlargement of the heart with marked pulmonary infiltration bilaterally within the inner one-third and one-half of the lung fields and first and second interspaces (Figure 2).

Course in the Hospital: The course of this patient's illness is summarized in Figure 3. The outstanding features were right heart failure and terrifying paroxysms of cough and cyanosis. Upon admission to the hospital he appeared in a terminal state but gradually responded to oxygen, digitalis, ammonium chloride, mercurial diuretics and hormonal therapy. He was semi-ambulatory by the early part of September but required a maintenance daily dose of digitalis and weekly or bi-weekly mercurial diuretic parenterally for control of orthopnea, peripheral edema and weight. A total of 1,730 gm. of ACTH were administered from August 18, 1950 to October 19, 1950, when he developed a moon-face appearance and medication was discontinued. During this time there was marked improvement in his sense of well being, cessation of vomiting and improvement in appetite but there was no alternation in the degree of pulmonary infiltration roentgenographically. Both urethane and later cortisone were given as shown in Figure 3 for a total of 68 gm. and 1900 mg., respectively. Repeated electrocardiographic tracings showed no changes other than that of right ventricular hypertrophy. There was no significant change in pulse rate or blood pressure at any time except terminally. The patient frequently required narcotics (codeine, meperidin or methadon) for relief or control of episodes of paroxysmal coughing which occurred most frequently during the night. In the last two weeks of life, dyspnea, paroxysmal cough and cyanosis gradually increased progressively into shock and he expired quietly on March 14, 1951, approximately 20 months after onset of illness.

Necropsy was performed 24 hours after death. Lightly pigmented superficial scars and numerous fresh and healing excoriations of the skin were distributed over the entire body. No edema of the face or extremities was noted.

Lungs: Both lungs were bound down to the chest wall by adhesions. The left weighed 690 gm. and the right, 620 gm. Both were firm on palpation in general with extreme firmness in the apices. The upper half of the lungs on cut section showed a mottled grayish-white and black, honey-combed appearance while the lower halves presented a dark red mottled surface. A thrombus occluded the right pulmonary artery at the hilus of the right upper lobe. The hilar lymph nodes were enlarged, reddish-black in color and firm in consistency on cut section.

Heart: The heart was markedly enlarged and weighed 600 gm. The right auricle and ventricle were dilated and hypertrophied. The myocardium of the right ven-

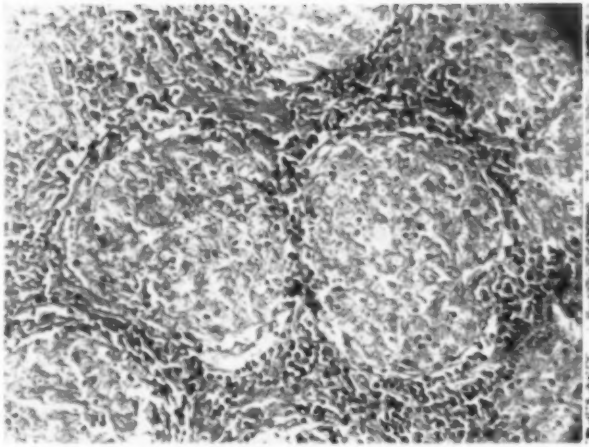


FIGURE 1

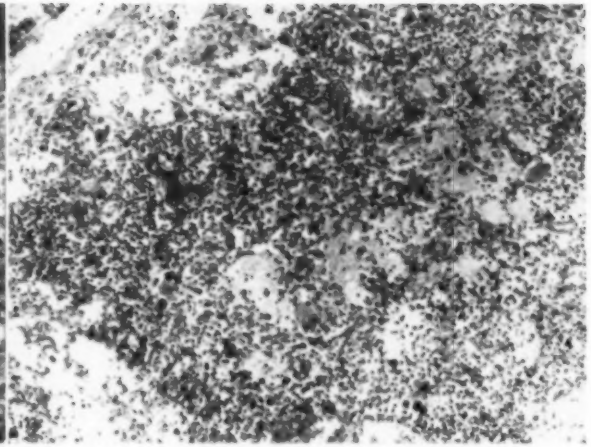


FIGURE 5

Figure 1: Microscopic section (x 150) of a lymph node biopsy made in August 1950, showing nodules of epithelioid cells without necrosis. — *Figure 5:* Microscopic section (x 100) of lymph node nineteen months after initial biopsy demonstrating fibrous tissue replacement. Note the absence of granulomatosis.

tricle measured 8 mm. in thickness. Otherwise the musculature, valves and coronary arteries appeared normal.

Spleen: The spleen weighed 220 gm. It was firm in consistency and on cut section revealed a dark purplish surface which did not scrape easily.

Liver: The liver weighed 1,500 gm. On cut section it demonstrated a typical nutmeg appearance.

The remainder of the necropsy was not significant.

Anatomic Diagnosis: Sarcoidosis of the hilar lymph nodes, lungs, liver and spleen; thrombosis of the right pulmonary artery; chronic cor pulmonale; apical fibrocaseous tuberculosis?

Microscopic Examination (Reported by Dr. D. F. Gleason, Pathologist, and Dr. A. C. Aufderhiede, Resident in Pathology, Department of Pathology, Veterans Administration Hospital, Minneapolis, Minnesota):

"*Lungs:* Many sections of the lung reveal a similar picture in that most of the parenchyma has been replaced by a vast amount of scar tissue throughout which are scattered small foci of lymphocytes (Figure 4). No active tuberculosis is seen anywhere, and there is no evidence of granulomas or tubercles. In some sections scar is seen to be in pleural and subpleural positions, although in other areas the scar appears to be deep in the pulmonary tissue itself. Some of the other sections reveal simple hypostatic congestion.

"*Liver:* An extreme degree of chronic passive congestion is seen as manifested by markedly dilated sinusoids and atrophy of the liver cords in the central areas.



FIGURE 2: Roentgenogram of the chest, November 30, 1950, showing cardiac enlargement with marked pulmonary infiltration.

This is so marked as to involve the central and mid portions of the lobules in most areas and in some areas even the entire lobule. No tubercles or granulomas are seen.

"*Pulmonary Artery:* A relatively recent unorganized thrombus is found in the section of the pulmonary artery.

"*Spleen:* No granulomas or tubercles are seen. Small areas of scar are scattered throughout the section.

"*Bone Marrow:* The marrow is normocellular and without granulomas or tubercles.

"*Lymph Nodes:* Section of multiple nodes, most of which appear to be bronchial in origin, reveal a similar picture in that a large amount of scar is seen within these nodes. Some of the nodes are involved to only a mild degree, others to an extreme degree. The scar in most of the nodes is rather diffuse, although in others appears in small focal areas. No evidence of tuberculosis or active epithelioid cell formation is noted (Figure 5). The original biopsy of this patient made at Letterman General Hospital was obtained for review and study. The node is seen to be occupied by vast numbers of epithelioid cell granulomas without necrosis. An occasional Langhans type giant cell is found in association with these tubercles but these cells are without asteroid bodies (Figure 1).

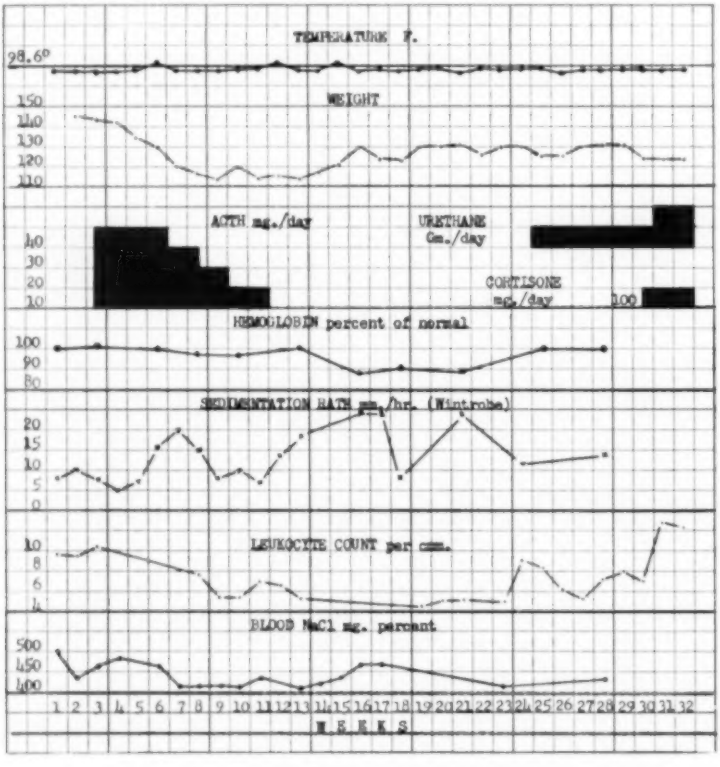


FIGURE 3: Chart summarizing course and therapy during last eight months of illness.

"Sections of the kidneys, heart, adrenals, pancreas, and prostate reveal no unusual changes.

"*Summary:* The cause of death is obviously thrombosis of the pulmonary artery. That increased pressure in the venous system has existed for sometime is manifested by the marked congestive changes in the liver. Although the original biopsy reveals changes in the lymph node characteristic of the syndrome usually described as 'Boeck's sarcoid,' it is of striking interest that the necropsy fails to reveal a single granuloma in spite of an intensive search for such a lesion. The fibrotic changes seen in the lymph nodes, as well as the spleen and possibly the lungs, could be interpreted as fibrosis of pre-existing granulomas in these structures, although conclusive evidence of this is lacking in view of the absence of demonstrable active lesions. In spite of the gross protocol note that some suspicious caseous areas were seen in the lung at necropsy, no such lesions were found microscopically despite sectioning of all material submitted for examination. In summary, this appears to be a case of 'Boeck's sarcoid' treated extensively with ACTH in which death occurred from thrombosis of the pulmonary artery and in which the necropsy failed to reveal any residual evidence of the disease.

"*Microscopic Diagnosis:* Thrombosis of the pulmonary artery; sarcoidosis?; chronic passive congestion of the liver."

Comment

This patient demonstrated the development of chronic cor pulmonale and severe paroxysms of coughing due to extensive sarcoidosis of the lungs. A fatal course appeared obvious, therefore treatment with adrenocorticotropic hormone (ACTH), cortisone and urethane were added empirically to the symptomatic and supportive regimen with the hope of altering the course of the disease. Knowing that heart failure is a relative contraindication to the use of ACTH and cortisone, and that sarcoidosis frequently shows active tuberculosis terminally, it was postulated that the possible therapeutic gain might outweigh the risk if the hormones were

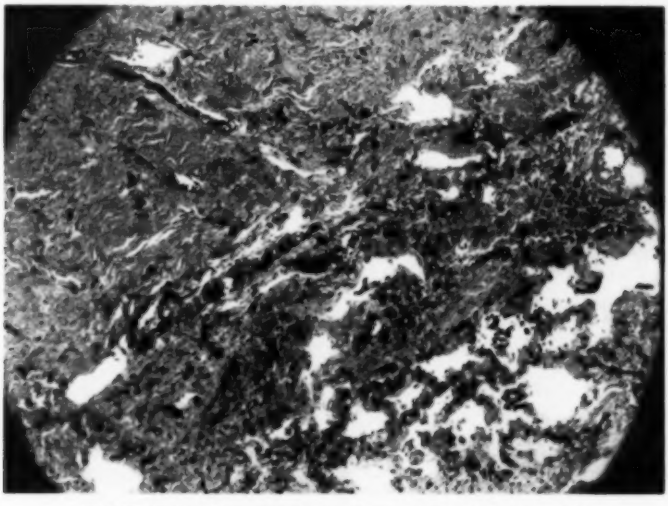


FIGURE 4: Microscopic section (x 60) of lung. Note marked fibrous tissue replacement.

administered with care. Outside of increasing the patient's sense of well being, no improvement of the lung involvement could be detected roentgenographically. Urethane also did not appear to alter the course. No change in the normal hematologic picture during the administration of urethane was noted. Impaired adrenal function associated with sarcoidosis as observed by Sones and his collaborators[1] was not evident in this case.

Deaths almost always result from direct or indirect complications of this enigmatic granulomatous disease. The relationship between sarcoidosis and pulmonary tuberculosis is not completely understood but their existence together is well known and need not be discussed.[3-5] Although fibrocaseous tuberculosis of the pulmonary apices was suspected on gross examination, no such lesion was reported microscopically after a diligent search in this case. Right heart failure secondary to extensive pulmonary involvement in sarcoidosis, uncommon as it is, has also been mentioned in the literature[3,4,6-8] but the occurrence of thrombosis of a pulmonary artery as a complication of sarcoidosis is reportedly unknown. Heart failure from other causes is recognized as a factor in the production of pulmonary thrombosis in situ. It reasonably provided the background in this instance.

Spontaneous remissions are frequently observed in sarcoidosis and it is generally considered a benign disease. The lesions may undergo fibrosis and replacement by hyalinized connective tissue and this is taken to indicate a healing or healed process.[8-10] The residual changes may, however, produce respiratory distress and right heart failure.[6,7] No recognizable sarcoid structure was detectable in any of the organs in this case. In its stead was a striking amount of scar tissue which presumably was preceded by epithelioid granulomatous lesions present before treatment. If the transformation occurred prior to therapy, it must be deduced that hormonal therapy has no beneficial effect on the end stage of sarcoidosis.

SUMMARY

A case of sarcoidosis complicated by chronic cor pulmonale and thrombosis of a pulmonary artery with post mortem findings is presented. Empirical trial with ACTH, cortisone and urethane clinically failed to alter the fatal course but autopsy failed to reveal any active sarcoid lesions. The presence of a large amount of scarring and collagen is taken to indicate a healing or healed process that occurred spontaneously and was not affected by the treatment or was induced by the hormonal or urethane therapy without benefit. Further confirmatory studies with these drugs in the earlier phase of this disease are necessary.

RESUMEN

Se presenta un caso de sarcoidosis complicado con cor pulmonale y thrombosis de la arteria pulmonar, con los hallazgos post-mortem. El tratamiento empérico con ACTH, cortisona y uretano clinicamente fracasó en evitar la evolución fatal pero la autopsia no reveló ninguna lesion activa de sarcoide. La presencia de gran cantidad de tejido cicatricial y colágeno se considera como proceso en curación o curado que aconteció

espontáneamente y no fué afectado por el tratamiento o inducido sin beneficio por la terapia hormonal o por uretano. Se necesitan estudios confirmativos con estas drogas en una faz temprana de la enfermedad.

RESUME

Les auteurs rapportent un cas de maladie de Besnier-Boeck-Schaumann, compliqué d'un coeur pulmonaire chronique et d'une thrombose de l'artère pulmonaire, avec les constatations faites à l'autopsie. Un traitement empirique à l'ACTH, cortisone et urethane ne permit pas de modifier l'évolution fatale. Mais il ne fut plus possible à l'autopsie de trouver la moindre lésion active de sarcoïdose. La présence d'une grande quantité de tissu cicatriciel et de tissu collagène indique qu'un processus de guèrison spontanée n'a pas été affecté par le traitement. Il est nécessaire de confirmer ces études par la connaissance de l'action de ces produits dans la phase précoce de la maladie.

REFERENCES

1 Sones, M., Israel, H. L., Dratman, M. B. and Frank, J. H.: "Effect of Cortisone in Sarcoidosis," *New England J. Med.*, 244:209, 1951.
2 Thorn, G. W., Forsham, P. H., Frawley, T. F., Hill, S. R. Jr., Roche, M., Staehlin, D. and Wilson, D. L.: "The Clinical Usefulness of ACTH and Cortisone," *New England J. Med.*, 242:865, 1950.
3 McCort, J. J., Wood, R. H., Hamilton, J. B. and Ehrlich, D. E.: "Sarcoidosis," *Arch. Int. Med.*, 80:293, 1947.
4 Rubin, E. and Pinner, M.: "Sarcoidosis," *Am. Rev. Tuberc.*, 49:146, 1944.
5 Pinner, M.: "Pulmonary Tuberculosis in the Adult," p. 312, Charles C. Thomas, Springfield, Illinois, 1945.
6 Tice, F. and Sweany, H. C.: "Fatal Case of Sarcoid with Autopsy Findings," *Ann. Int. Med.*, 15:597, 1941.
7 Zimmerman, I. and Mann, N.: "Boeck's Sarcoid: A Case of Sarcoidosis Complicated by Pulmonary Emphysema and Cor Pulmonale," *An. Int. Med.*, 31:153, 1949.
8 Ricker, W. and Clark, M.: "Sarcoidosis," *Am. J. Clin. Path.*, 19:725, 1949.
9 McKerson, D. A.: "Boeck's Sarcoid: Report of Six Cases in Which Autopsies Were Made," *Arch. Path.*, 24:19, 1937.
10 Schaumann, J.: "Benign Lymphogranulomatosis in the Light of Prolonged Clinical Observations and Autopsy Findings," *Brit. J. Dermat.*, 48:399, 1936.

Lipoid Cell Pneumonia: Report of a Case

JOSEPH M. MILLER, M.D. and MILTON GINSBERG, M.D.*
Ft. Howard, Maryland

A moderate degree of interest in lipoid cell pneumonia has been reflected in a number of reports in the literature to which we desire to add the following case.

V.H.B. (R-27,118), a 60 year old white male was admitted to the Veterans Administration Hospital on July 2, 1949, with a history of recurrent hemoptysis for about one month. A cough, productive of about 120 cc. of purulent sputum a day, which did not contain blood grossly, was present in June, 1949. A moderate degree of weakness, anorexia and pain in the right side of the thorax and the loss of a small amount of weight were associated with the cough.

A mucopurulent exudate was present in both ears and the tympanic membranes were scarred and retracted. Loud wheezes which disappeared on coughing were present over the upper lobe of the right lung. A systolic murmur over the apex of the heart and a harsh systolic aortic murmur were present. The blood pressure was 126/90.

The roentgenogram of the chest (Figure 1) showed an irregular infiltration in the right lung field extending out from the hilum. A second roentgenogram taken about two weeks later was the same.

Blood counts, Eagle flocculation and urinalysis were normal. Numerous examinations of the sputum were negative for acid fast bacilli, fungi, parasites and neoplastic cells.

Bronchoscopy on July 15 showed a slightly thickened carina and a marked degree of inflammation about the orifice to the upper lobe of the right lung. Bronchial washings were negative for fungi, parasites and neoplastic cells. Bronchoscopy on August 2 showed chronic inflammation of the right bronchial tree and a localized area of thickened tissue about three cm. below the carina on the medial wall of the left main bronchus. Biopsy from this area showed normal bronchial mucosa.

Cough during the period of stay in the hospital was slight and productive. The temperature remained normal. The patient was discharged on August 30 with a diagnosis of fibrosis of the upper lobe of the right lung due to an undetermined cause. When seen as an out-patient on September 30, the patient stated that he was well.

The patient was admitted again to the hospital on October 4, 1950. A productive cough with occasional hemoptysis had been present for about six weeks. Pain in the chest had been present for about six weeks.

The roentgenogram of the chest showed a scattered infiltration in the upper lobe of the right lung (Figure 2). The roentgenologist thought that the lesion now might be a carcinoma.

Bronchoscopy on October 13 showed chronic inflammation of the right bronchial tree. Bronchial washings from the upper lobe of the right lung revealed cells interpreted as being normal bronchial mucosa.

Since the diagnosis in this individual was still in doubt, an exploratory thoracotomy was done. A firm, rubbery mass was found in the upper lobe of the right

*Department of Surgery, Veterans Administration, Fort Howard, Maryland.

Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.



FIGURE 1 FIGURE 2 FIGURE 4

Figure 1: Roentgenogram of chest on July 21, 1949, showing irregular infiltration in right lung.—*Figure 2:* Roentgenogram of chest on November 17, 1950, showing increase in area of infiltration in right lung. — *Figure 4:* Roentgenogram of chest on April 20, 1951, showing post-operative result.

lung. Extension to the middle or the lower lobe or to the mediastinum had not occurred. The procedure of choice seemed lobectomy which was done.

Microscopic examination of the specimen showed severe chronic inflammation. Extensive bronchiectasis with lipoid cell pneumonia was found (Figure 3).

When the diagnosis was determined, the patient was questioned about the use of oil. He stated that he had sustained a rupture of both tympanic membranes as the result of blast from the explosion of a shell in World War I and that bilateral chronic otitis media had followed. Pain and the gradual onset of deafness were noted. Oily medication of various types had been put into both aural canals for many years.

The postoperative course was uneventful. The patient was discharged from the hospital on December 22.

The patient was seen on subsequent visits on January 22 and April 20, 1951, when the roentgenogram of the chest was normal (Figure 4). He was completely asymptomatic and had returned to his regular occupation.

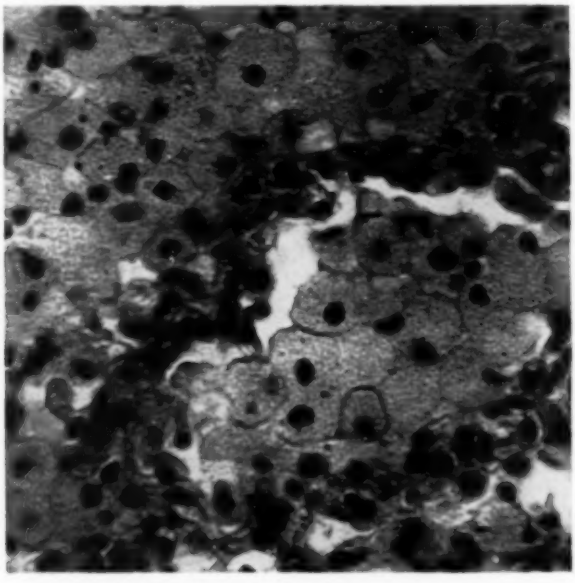


FIGURE 3: Area of lipoid cell pneumonia.

Comment

Being an obscure condition presenting a picture of low grade pulmonary infection, lipoid cell pneumonia is difficult to recognize. A high index of suspicion, in a patient with an unusual shadow on the roentgenogram of the chest, should serve to keep the condition in mind. The history should include questions about the administration of oil in the various orifices communicating with the respiratory tract, particularly in the chronically ill and the aged. A history of nasal disease for which intranasal medication was given, the presence of oral pathologic conditions permitting aspiration and the presence of dysphagia will aid in making a diagnosis. The condition has a slow course which may or may not be

attended by symptoms. Fat or macrophages containing fat may be isolated from the sputum. Nathanson, Frenkel and Jacobi[1] were able to make a diagnosis of lipoid cell pneumonia by aspiration of the affected area of lung and finding fat in the aspirated cells by microscopic examination. Schneider[2] reports that the roentgenogram is characteristic in that the lesion extends peripherally, atelectatic phenomena are absent and hilar adenopathy is not seen.

SUMMARY

Lipoid cell pneumonia is an unusual lesion which may be confused with carcinoma of the lung. A patient with this condition caused by repeated instillation of oily medication for bilateral *otitis media* with perforation of ear drums is reported.

RESUMEN

La neumonía lipoidea es una lesión rara que puede ser confundida con el carcinoma del pulmón. Se comunica un caso de esa afección que fué causado por las instilaciones repetidas de medicamentos aceitosos para perforaciones con *otitis media* bilaterales de los tímpanos.

RESUME

La pneumonie huileuse est une lésion qui n'est pas fréquente et peut se confondre avec le cancer du poumon. Les auteurs rapportent l'observation d'un malade qui s'est trouvé dans ce cas; la pneumonie huileuse avait pour cause des instillations répétées d'huile à la suite d'une perforation d'une otite moyenne bilatirale des tympans.

REFERENCES

1 Nathanson, L., Frenkel, D. and Jacobi, M.: "Diagnosis of Lipoid Pneumonia by Aspiration Biopsy," *Arch. Int. Med.*, 72:627, 1943.
2 Schneider, L.: "Pulmonary Hazard of the Ingestion of Mineral Oil in the Apparently Healthy Adult," *N.E.J.M.*, 240:284, 1949.

New York City Invites You

300th ANNIVERSARY

1653-1953

A CORDIAL INVITATION is extended to you to attend the 19th Annual Meeting of the American College of Chest Physicians to be held at the Hotel New Yorker, New York City, May 28-31, 1953.

An innovation at our meeting this year will be a series of seminars to be conducted by prominent members of the College. These seminars will be presented on Wednesday, May 27. A list of the subjects to be discussed at each seminar, together with a registration form, appear in this pamphlet. Members are urged to avail themselves of this excellent opportunity for postgraduate medical education in diseases of the chest.

Dr. Arthur M. Olsen, Mayo Clinic, Rochester, Minnesota, the chairman of the Committee on Scientific Program, is to be congratulated upon the organization of an outstanding program. The members of the committee, who collaborated with Dr. Olsen in preparing this program, are also to be complimented.

There will be fewer formal presentations this year as greater emphasis has been placed on panel discussions in order to permit a maximum of audience participation. The popular round table luncheon meetings will again be presented and you are urged to send in your reservations as early as possible because attendance must be restricted to the seating capacity of the rooms. The annual X-ray Conference will be conducted by Dr. Laurence L. Robbins, Assistant Professor of Radiology, Harvard University, and Radiologist-in-Chief, Massachusetts General Hospital. The usual motion picture session dealing with the latest developments in the field of diseases of the chest will be presented on Friday night, May 29.

The official opening of the scientific sessions will take place at the Hotel New Yorker on Thursday night, May 28 at 8 p. m. Among the guest speakers from other countries who will participate in the scientific program are Sir Alexander Fleming and Dr. Richard R. Trail of London, England.

The oral and written examinations for Fellowship in the College will be held on Thursday, May 28 and the Board of Regents, Board of Governors and Councils and Committees of the College will hold their annual meeting on this day. The Conference of College Chapter Officials will hold their regular luncheon meeting on Thursday, May 28. It is incumbent upon officials and members of national councils and committees to attend these important meetings.

The formal Convocation for the awarding of Fellowship Certificates will take place in the North Ballroom of the Hotel New Yorker on Saturday, May 30. This will be followed by a cocktail party sponsored by the Panray Corporation and the Presidents' Banquet, to be held in the Grand Ballroom. The College Medal will be awarded at the banquet to a prominent scientist for meritorious achievement in the specialty of diseases of the chest. The New York State Chapter of the College will sponsor dancing and entertainment following the dinner.

The Ladies Reception Committee has prepared a very fine social program which I shall appreciate your bringing to the attention of your wife.

New York City is celebrating its 300th Anniversary this year. Let us all plan to assemble there and assist in this great celebration. I shall be looking forward with much pleasure to greeting you at the Hotel New Yorker.

Sincerely,

Andrew L. Banyai, M.D.
President.

SEMINARS

Hotel New Yorker, Wednesday, May 27

The following Seminars on Diseases of the Chest will be presented at the Hotel New Yorker on Wednesday, May 27. They have been planned for informal discussion by small groups and preference for registration will be given to members of the College. These Seminars have been accredited by the Board of Examiners for candidates for Fellowship in the College.

The registration fee for each Seminar, which consists of a series of three lectures, is $7.50. Registration must be made in advance and accompanied by the tuition fee; seating capacity is limited and reservations will be accepted in the order in which they are received. A coupon for this purpose will be found on page 468. Please indicate your preference by number.

Morning Sessions — 9:00 a.m. - 12:00 noon

AM-1 George G. Ornstein, New York City, Chairman

"Angiocardiography"
Israel Steinberg, New York City.

"An Aspect of Chest Radiology"
Henry K. Taylor, New York City.

"Sectional Radiography of the Chest"
Irving Kane, New York City.

AM-2 Charles E. Hamilton, Brooklyn, New York, Chairman

"Technique and Indications for Bronchoscopy"
Louis H. Clerf, Philadelphia, Pennsylvania.

"Nose and Throat in Relation to Pulmonary Disease"
Arthur Cracovaner, New York City.

"Bronchiectasis and Lung Abscess, Medical Aspects"
Seymour M. Farber, San Francisco, California.

AM-3 Edgar Mayer, New York City, Chairman

"Surgery of Tuberculosis"
J. Maxwell Chamberlain, New York City.

"Surgery of Nontuberculous Diseases"
Herbert C. Maier, New York City.

"Cardiovascular Surgery"
Charles P. Bailey, Philadelphia, Pennsylvania.

Afternoon Sessions — 1:30 p.m. - 4:30 p.m.

PM-1 James S. Edlin, New York City, Chairman

"Antibiotics in Nontuberculous Disease"
Arthur M. Olsen, Rochester, Minnesota.

"Therapy of Tuberculosis"
Eli H. Rubin, Bronx, New York.

"Use of ACTH and Cortisone in Pulmonary Diseases"
Maurice S. Segal, Boston, Massachusetts.

PM-2 Hyman Alexander, New York City, Chairman

"Emphysema and Bronchial Asthma"
Alvan L. Barach, New York City.

"Pulmonary Function Tests"
George R. Meneely, Nashville, Tennessee.

"Varieties of Pressure Breathing Used in Respiratory Diseases"
Gustav Beck, New York City.

PM-3 Harry Golembe, Liberty, New York, Chairman

"Malignancy of the Lung, Medical Aspects"
Foster Murray, Brooklyn, New York.

"Treatment of Congestive Failure"
Aldo A. Luisada, Chicago, Illinois.

"Occupational Diseases of the Chest"
Anthony J. Lanza, New York City.

SCIENTIFIC PROGRAM

The scientific sessions of the College will begin promptly as scheduled and it is requested that the audience be seated at least five minutes prior to the opening of the session.

Thursday, May 28

8:00 p.m. — *General Scientific Session*

Arthur M. Olsen, Rochester, Minnesota, Chairman
Howell Randolph, Phoenix, Arizona, Secretary

Introductory Remarks — Edgar Mayer, New York City, Chairman
Committee on General Arrangements.

"Newer Developments in Penicillin Therapy"
Sir Alexander Fleming, London, England.

"Surgical Treatment of Pulmonary Hydatids"
Reeve H. Betts, Vellore, India.

"The Diagnosis and Management of Chylothorax"
Roy G. Klepser and James F. Berry, Washington, D. C.

"The Management of Spontaneous Pneumothorax"
L. M. Shefts, Randolph Air Force Base and
Cleston Gilpatrick, Fort Sam Houston, Texas.

"Sarcoma of the Lung"
Theodore R. Noehren, Buffalo and
Frank W. McKee, Rochester, New York.

Friday, May 29

9:00 a.m. — *Scientific Session*

J. Winthrop Peabody, Washington, D. C., Chairman
Arthur Q. Penta, Schenectady, New York, Secretary

Symposium on Pulmonary Function and Physiologic Therapy

"Degenerative Lung Disease"
Gerald L. Crenshaw and Donald F. Rowles, Oakland, California.

"Pulmonary Function in Different Postures: Therapeutic Considerations"
Zoltan Mann, Fort Bayard, New Mexico.

"The Clinical Use of Intermittent Positive Pressure Breathing Combined with Nebulization in Chronic Pulmonary Disease"
Peter A. Theodos, Philadelphia, Pennsylvania.

"Present Status of Aerosol Therapy with Proteolytic Enzymes: Studies on the Cytology of Bronchial Secretions"
William Habeeb, Springfield, Ohio: Howard G. Reiser, Omaha, Nebraska and L. C. Roettig, Columbus, Ohio.

"The Visco-Elastic Properties of the Lungs in Emphysema"
J. Mead and J. L. Whittenberger, Boston, Massachusetts.

Clinical Application of Physiologic Procedures

Panel Discussion: Edwin R. Levine, Chicago, Illinois, *Moderator*
Alvan L. Barach, New York City
Hurley L. Motley, Los Angeles, California
George G. Ornstein, New York City
Maurice S. Segal, Boston, Massachusetts
J. L. Whittenberger, Boston, Massachusetts
George W. Wright, Saranac Lake, New York

12:00 Noon — *Round Table Luncheon Meetings* **(see pages 461 and 462)**

2:00 p.m. — *Scientific Session*

Alvis E. Greer, Houston, Texas, Chairman
Hollis E. Johnson, Nashville, Tennessee, Secretary

Symposium on Electrocardiography

Panel Discussion: John F. Briggs, St. Paul, Minnesota, *Moderator*

"The Normal Electrocardiogram"
Louis Wolff, Boston, Massachusetts.

"The Electrocardiogram of the Normal Child and of the Child with Congenital Heart Disease"
Robert F. Ziegler, Detroit, Michigan.

"The Electrocardiogram in the Disturbances of Cardiac Rate and Rhythm"
Richard Langendorff, Chicago, Illinois.

"Diagnostic Electrocardiographic Patterns"
Arthur M. Master, New York City.

"Non-Diagnostic Electrocardiographic Patterns"
Nathaniel Reich, Brooklyn, New York.

"The Clinical Value of Electrocardiography"
Aldo A. Luisada, Chicago, Illinois.

3:30 p.m. —

Symposium on the Rehabilitation of the Cardiac Patient

Panel Discussion: Nathaniel Reich, Brooklyn, New York, *Moderator*

"Traumatic Pericarditis"
R. W. Kissane, Columbus, Ohio.

"Complete Functional Recovery Following Coronary Occlusion and Insufficiency"
Arthur M. Master, New York City.

"Surgical Rehabilitation of the Cardiac for Work"
Charles P. Bailey, Philadelphia, Pennsylvania.

"Methods of Evaluating Work Capacity of Cardiac Cases"
J. G. Bielawski, Detroit, Michigan.

"Problems Affecting Cardiac Patients"
Workmen's Compensation Board, New York State Department of Labor
Hon. Alphonse P. Guardine, Vice-Chairman, Hon. Jacob Schutzbank, Administrator of Claims, and Irving Klein, Staff Cardiologist.

8:00 p.m. — *Motion Picture Session on Diseases of the Chest*

George Foster Herben, Yonkers, New York, Chairman
Biagio Battaglia, Brooklyn, New York, Secretary

"Congenital Malformations of the Heart"
University of Washington, Seattle, Washington.

"Needle Biopsy of the Lung"
George P. Rosemond, Philadelphia, Pennsylvania.

"Surgical Treatment of Aortic Stenosis"
Charles P. Bailey and Houck E. Bolton, Philadelphia, Pennsylvania.

"Endobronchial Tuberculosis"
Paul H. Holinger and Kenneth C. Johnston, Chicago, Illinois.

"Heart and Lung Machine"
Forest D. Dodrill, Detroit, Michigan.

"Decortication of the Unexpandable Pneumothorax Lung"
David H. Waterman, Knoxville, Tennessee.

"Coronary Circulation"
Myron Prinzmetal, Los Angeles, California.

Saturday, May 30

10:00 a.m. — *Scientific Session*

Edward W. Hayes, Monrovia, California, Chairman
George R. Maxwell, Morgantown, West Virginia, Secretary

Symposium on Occupational Diseases of the Chest

(Associated with inhalation of industrial mineral particles)

Panel Discussion: Raymond Hussey, Chicago, Illinois, *Moderator*

"Soft Coal Workers' Pneumoconiosis," L. L. Friedman, Birmingham, Ala.
"Physiologic Therapy," Burgess L. Gordon, Philadelphia, Pennsylvania.
"Environmental Dust Control," Leonard Greenburg, New York City.
"Berylliosis," Harriet L. Hardy, Boston, Massachusetts.
"Rehabilitation," Louis Mark, Columbus, Ohio.
"Pulmonary Function," George R. Meneely, Nashville, Tennessee.
"Medicolegal Aspects," William E. Mitch, Birmingham, Alabana.
"Roentgenographic Characteristics," Oscar A. Sander, Milwaukee, Wis.
"Diatomaceous Earth," Reginald H. Smart, Los Angeles, California.
"Etiology, Pathology and Pathogenesis," A. J. Vorwald, Saranac Lake, N. Y.
"Medicolegal Aspects," Theodore C. Waters, Baltimore, Maryland.

12:00 Noon — *Round Table Luncheon Meetings* **(see pages 461 and 462)**

2:00 p.m. — *Scientific Session*

William A. Hudson, Detroit, Michigan, Chairman
Seymour M. Farber, San Francisco, California, Secretary

"The Papworth Village Settlement"
Richard R. Trail, London, England.

"Complications and Sequellae of Pneumoperitoneum"
Robert T. Fox, J. R. Thompson, Otto L. Bettag, William M. Lees and Earl R. Gilbert, Chicago, Illinois.

"The Surgery of Pulmonic Stenosis by the Direct Intracardiac Approach"
Robert P. Glover, Thomas J. E. O'Neill and Robert E. Wells, Philadelphia, Pennsylvania.

3:30 p.m. — *X-Ray Conference*

Laurence L. Robbins, Boston, Massachusetts, *Moderator*

Sunday, May 31

9:00 a.m. — *Scientific Session*

J. Arthur Myers, Minneapolis, Minnesota, Chairman
M. Jay Flipse, Miami, Florida, Secretary

Tuberculosis

"Pulmonary Resection in Childhood Tuberculosis"
Gladys Boyd and F. R. Wilkinson, Toronto, Canada.

"Isoniazid in Tuberculous Meningitis"
Mark H. Lepper, Harold W. Spies, Norman H. Blatt and Harry F. Dowling, Chicago, Illinois.

"Control Study of Isoniazid, a Public Health Service Cooperative Investigation"
Rufus Payne, Augusta, Georgia.

"Chemotherapy in the Treatment of Pulmonary Tuberculosis"
Ralph E. Moyer, Oteen, North Carolina.

The Place and Time for Resection in Prolonged Streptomycin-PAS Therapy

Panel Discussion: William B. Tucker, Minneapolis, Minnesota, *Moderator*
Robert G. Bloch, New York City
David A. Cooper, Philadelphia, Pennsylvania
Edgar Mediar, Ithaca, New York
Richard H. Overholt, Brookline, Massachusetts
William Steenken, Trudeau, New York

12:00 Noon — *Round Table Luncheon Meetings* **(see pages 461 and 462)**

2:00 p.m. — *Scientific Session*

William E. Adams, Chicago, Illinois, Chairman
John Roberts Phillips, Houston, Texas, Secretary

Symposium on Postoperative Management in Thoracic Surgery

Panel Discussion: John H. Gibbon, Jr., Philadelphia, Pennsylvania, *Moderator*

"Postoperative Management of Bronchopleural Fistula and the Pleural Space Following Pneumonectomy"
Otto C. Brantigan, Baltimore, Maryland.

"Postoperative Management of Cardia Arrest and Ventricular Fibrillation"
Julian Johnson and Charles K. Kirby, Philadelphia, Pennsylvania.

"Postoperative Management of the Unexpanded Lung Following Pulmonary Resection"
John B. Grow, Denver, Colorado.

"Postoperative Management of Bronchial Obstruction with Atelectasis and Pneumonitis"
Herbert C. Maier, New York City.

"Postoperative Management of Disturbed Pulmonary Function by Overdistention of the Lung"
O. T. Clagett and H. F. Helmholz, Jr., Rochester, Minnesota.

"Pulmonary Edema, Etiology and Therapy"
E. J. Beattie, Chicago, Illinois.

"Interference with Nervous, Vascular and Pulmonary Structures During Surgery of the Lung"
Alfred N. Goldman, Beverly Hills, Alfred Breckler, Jerome E. Abrahams, and William J. Gyarfas, Los Angeles, California.

ROUND TABLE LUNCHEONS

Friday, May 29

A-1 Mechanical Aids to Respiration
Hurley L. Motley, Los Angeles, California; Maurice S. Segal, Boston, Massachusetts; J. L. Whittenberger, Boston, Massachusetts; George W. Wright, Saranac Lake, New York.
Moderator: Alvan L. Barach, New York City.

A-2 The Substitute Heart and/or Lung
Forest D. Dodrill, Detroit, Michigan; Charles A. Hufnagel, Washington, D. C.; B. J. Miller, Philadelphia, Pennsylvania.
Moderator: Clarence Dennis, New York City.

A-3 Treatment of Pulmonary Tuberculosis in the Very Young and Very Old
Frederick Beck, Ray Brook, New York; Edith Lincoln, New York City; Louis Mark, Columbus, Ohio; Carl Muschenheim, New York City.
Moderator: Harold G. Trimble, Oakland, California.

A-4 Advances in Treatment of Cardiac Arrhythmias
H. Easton McMahon, New York City; E. Sterling Nichol, Miami Beach, Florida; David Scherf, New York City.
Moderator: Robert L. Parker, Rochester, Minnesota.

A-5 Management of Bronchiectasis
Theodore R. Noehren, Buffalo, N. Y.; Howell Randolph, Phoenix, Arizona; John V. Thompson, Indianapolis, Indiana; Leon Unger, Chicago, Illinois.
Moderator: H. J. Moersch, Rochester, Minnesota.

A-6 The Influence of the Location of the Disease on the Therapy of Pulmonary Tuberculosis
Leroy H. Berard, Chicago, Illinois; Duane Carr, Memphis, Tennessee; Kirby Howlett, Shelton, Connecticut; James Feffer, Washington, D. C.
Moderator: J. Maxwell Chamberlain, New York City.

Saturday, May 30

B-1 *Present Status of ACTH and Cortisone in Diseases of the Chest*
H. A. Bickerman, New York City; Ethan A. Brown, Boston, Massachusetts; D. S. Lukas, New York City; Maurice S. Segal, Boston, Massachusetts.

Moderator: Seymour M. Farber, San Francisco, California.

B-2 *Esophageal Obstruction*
F. E. Donoghue, Rochester, Minnesota; Frederic E. Templeton, Seattle, Washington.

Moderator: Ralph Adams, Boston, Massachusetts.

B-3 *Medicolegal Aspects of the Pneumoconioses*
William E. Mitch, Birmingham, Ala.; Theodore Waters, Baltimore, Md.

Moderator: Edgar Mayer, New York City.

B-4 *Advances in the Treatment of Hypertension*
A. M. Fishberg, New York City; Jere Lord, New York City; Henry A. Schroeder, St. Louis, Missouri.

Moderator: Charles C. Wolferth, Philadelphia, Pennsylvania.

B-5 *Current Treatment of Pneumonias*
Harrison Flippin, Philadelphia, Pennsylvania; Milton Helpern, New York City; George G. Jackson, Chicago, Illinois.

Moderator: Alfred Goldman, St. Louis, Missouri.

B-6 *Home Treatment vs. Sanatorium Care in Tuberculosis*
Henry W. Leetch, Saranac Lake, New York; Joseph Wassersug, Quincy, Massachusetts; Norman Wilson, Boston, Massachusetts.

Moderator: Roger S. Mitchell, Trudeau, New York.

Sunday, May 31

C-1 *Physiologic Management of Bronchial Asthma and Pulmonary Emphysema*
Alvan L. Barach, New York City; Edwin R. Levine, Chicago, Illinois.

Moderator: Allan Hurst, Denver, Colorado.

C-2 *Ill Effects of Overdistension Following Pulmonary Resection and Means of Preventing Overdistention*
Otto C. Brantigan, Baltimore, Maryland; H. Fred Helmholz, Rochester, Minnesota; Herbert C. Maier, New York City.

Moderator: John B. Grow, Denver, Colorado.

C-3 *Non-Bronchogenic Cystic Lung Disease, Surgical Management*
Edward J. Beattie, Chicago, Illinois; W. E. Burnett, Philadelphia, Pennsylvania; Jerome R. Head, Chicago, Illinois.

Moderator: O. T. Clagett, Rochester, Minnesota.

C-4 *Rehabilitation of the Patient with Chest Disease*
B. B. Bagby, Jr., Oteen, North Carolina; Holland Hudson, New York City; John Norris, Rochester, New York.

Moderator: Leonard C. Evander, Lockport, New York.

Remarks: R. S. Anderson, Erie, Pa., Chairman, Council on Hospitals.

C-5 *Present Status of Cardiac Surgery*
Claude Beck, Cleveland, Ohio; Alfred N. Goldman, Beverly Hills, California; Robert Gross, Boston, Massachusetts.

Moderator: Richard H. Overholt, Brookline, Massachusetts.

C-6 *Present Status of Isoniazid in Treatment of Tuberculosis*
Oscar Auerbach, East Orange, New Jersey; Sumner Cohen, Oak Terrace, Minnesota; Rufus Payne, Augusta, Georgia; Edward Robitzek, Staten Island, New York; Eli Rubin, Bronx, New York.

Moderator: Karl H. Pfuetze, Chicago, Illinois.

SECTION ON DISEASES OF THE CHEST

AMERICAN MEDICAL ASSOCIATION

North Ballroom

Hotel New Yorker, New York City

Tuesday, June 2, 2:00 p.m.

Chairman's Address — Joseph C. Placak, Cleveland, Ohio

"Mediastinal Tumors: A Survey of Modern Concepts in Diagnosis and Treatment"
J. Winthrop Peabody, Jr., Lawrence H. Strug and James D. Rives, New Orleans, Louisiana.

"Clinical Observations in the Origins of Pulmonary Cysts, Bronchiectasis and Emphysema"
Edgar Mayer, New York City.

Panel Discussion: "Diagnosis of Chest Disease"
Andrew L. Banyai, Milwaukee, Wisconsin, *Moderator*

Paper: "The Diagnosis of Chest Disease"
James S. Edlin, New York City

Panel: John S. Bouslog, Denver, Colorado: Roentgenologist
Jerome R. Head, Chicago, Illinois: Chest Surgeon
David M. Spain, Valhalla, New York: Pathologist

Wednesday, June 3, 2:00 p.m.

Panel Discussion: "The Diagnosis and Treatment of Hypertension"
Edgar V. Allen, Rochester, Minnesota, *Moderator*

Panel: Irvine H. Page, Cleveland, Ohio
Robert W. Wilkins, Boston, Massachusetts
Keith S. Grimson, Durham, North Carolina
S. W. Hoobler, Ann Arbor, Michigan

Business Meeting — Election of Officers

Symposium: "Modern Trends in Chest Surgery"
Alfred N. Goldman, Beverly Hills, California, *Moderator*

"Surgical Management of Benign and Malignant Tumors of the Lung Discovered in X-Ray Survey"
Brian B. Blades, Washington, D. C.

"Surgical Treatment of Bronchiectasis: Indications and Results"
Richard H. Overholt, Brookline, Massachusetts.

"Modern Surgical Management of Mediastinal Infections and Tumors"
Arthur S. Touroff, New York City.

General Discussion

Thursday, June 4, 2:00 p.m.

Joint meeting with the Section on General Practice

Panel Discussion: "The Diagnosis and Treatment of Cardiac Emergencies"
Arthur M. Master, New York City, *Moderator*

"Treatment of Left Heart Failure, Particularly Pulmonary Edema"
Clarence E. De la Chapelle, New York City.

"The Treatment of Coronary Occlusion Including Shock"
Herrman L. Blumgart, Boston, Massachusetts.

"The Treatment of Cardiac Arrhythmias"
Myron Prinzmetal, Los Angeles, California.

Open Discussion

Panel Discussion: "The Diagnosis and Treatment of Surgical Emergencies of the Chest"
Ivan Baronofsky, Minneapolis, Minnesota, *Moderator*

"Thoracic Vascular Emergencies"
Frank L. A. Gerbode, San Francisco, California.

"Emergencies of the Lung and Esophagus"
J. Gordon Scannell, Boston, Massachusetts.

"Chest Wall Injuries"
Donald Paulson, Dallas, Texas.

Open Discussion

Officers of the Section

Joseph C. Placak, Cleveland, Ohio, Chairman
Jay Arthur Myers, Minneapolis, Minnesota, Vice-Chairman
John F. Briggs, St. Paul, Minnesota, Secretary
Hollis E. Johnson, Nashville, Tennessee, Delegate
Edward W. Hayes, Monrovia, California, Alternate

SCIENTIFIC EXHIBITS

Section on Diseases of the Chest

AMERICAN MEDICAL ASSOCIATION

Grand Central Palace

New York City, June 1 - 5, 1953

"The Role of Hypothermia in Cardiac Surgery"
Charles P. Bailey, Brian A. Cookson, Daniel F. Downing, Houck E. Bolton, William Likoff and William L. Jamison, Philadelphia, Pennsylvania.

"Prolonged Relief of Thoracic Pain"
W. Ralph Deaton, Jr., Greensboro, and H. H. Bradshaw, Winston Salem, North Carolina.

"Effect of Streptomycin on the Bronchocavitary Junction and Its Relation to Cavity Healing"
L. Paul Flory, Washington, D.C., Harry L. Katz, Brooklyn, New York, Oscar Auerbach and Maurice J. Small, East Orange, New Jersey.

"Pneumoconiosis in Soft Coal Workers—Tissue and Roentgenographic Changes"
Louis L. Friedman, Birmingham, Alabama.

"Stenotic Valvular Heart Disease—Results of Surgery"
Robert P. Glover, Thomas J. E. O'Neill, O. Henry Janton, Louis A. Soloff, and James S. Harris, Philadelphia, Pennsylvania.

"Multiple Chemotherapy and Bacterial Genetics in Modern Medical Practice"
Edwin J. Grace, Brooklyn, and Vernon Bryson, Cold Spring Harbor, New York.

"Analysis of Failures of Prolonged Streptomycin-PAS Treatment of Pulmonary Tuberculosis"
Gordon M. Meade and Roger S. Mitchell, Trudeau, New York.

"An Overall View of the Results of Isoniazide and Iproniazide at Sea View Hospital from June 1950 to May 1, 1953.
George G. Ornstein, Edward H. Robitzek, David Reisner, Irving J. Selikoff, Samuel E. Kamen, Vladimir Altmann and Irving F. Klein, New York City.

"Recent Advances in Treatment of Lung Cancer"
William L. Watson, John L. Pool, William G. Cahan, Raymond K. J. Luomanen and Alexander J. Conte, New York City.

ADMINISTRATIVE SESSIONS
AMERICAN COLLEGE OF CHEST PHYSICIANS

Wednesday, May 27

8:00 a.m. — Registration

Registration for the annual meeting of the College will open at 8:00 a.m., Wednesday, May 27, on the Mezzanine Floor of the Hotel New Yorker. There will be registration desks for members, guests and ladies, as well as a desk where tickets for the various College functions may be purchased. Please register early and purchase all tickets at the time of registration. Admittance to the scientific sessions will be by badge only.

2:00-4:00 p.m. — Executive Council

Thursday, May 28

8:00- 9:00 a.m. — Board of Examiners, Breakfast Meeting
9:00-12:00 noon — Oral Examinations
9:00-11:00 a.m. — Board of Governors
9:00-11:00 a.m. — Council on Postgraduate Medical Education
10:00-11:00 a.m. — Committee on Scientific Program
11:00-12:00 noon — Committee on Certification
11:00-12:00 noon — Committee on Sanatorium Standards
11:00-12:00 noon — Committee on Rehabilitation
11:00-12:00 noon — Committee on Hospital Statistics
11:00-12:00 noon — Committee on Chest Diseases in Institutions
11:00-12:00 noon — Committee on Psychosomatic Aspects, Diseases of the Chest
12:00 noon — Conference of College Chapter Officials, Board of Regents, Board of Governors, Councils and Committees, Luncheon Meeting
2:00- 4:00 p.m. — Board of Regents
2:00- 5:00 p.m. — Written Examinations
2:00- 4:00 p.m. — Council on Hospitals
4:00- 5:00 p.m. — Council on Hospitals, Open Forum
4:00- 6:00 p.m. — Council on Undergraduate Medical Education
4:00- 6:00 p.m. — Committee on Non-Surgical Collapse Therapy
4:00- 6:00 p.m. — Committee on Surgical Treatment of Diseases of the Chest
4:00- 6:00 p.m. — Committee on Chemotherapy and Antibiotics
4:00- 6:00 p.m. — Committee on Physiologic Treatment
4:00- 6:00 p.m. — Committee on Cardiovascular Disease
4:00- 6:00 p.m. — Committee on Bronchoesophagology
4:00- 6:00 p.m. — Council on Public Health, Committee on Liaison with State and County Medical Societies
6:00- 8:00 p.m. — Council on Research, Dinner Meeting

Friday, May 29

9:00-10:00 a.m. — Editorial Board
9:00-10:00 a.m. — Committee on Motion Pictures
10:00-11:00 a.m. — Committee on College Award
11:00-12:00 noon — Committee on College Essay
2:00- 3:00 p.m. — Committee on Nominations
4:00- 6:00 p.m. — Joint Committee on Occupational Diseases of the Chest
Industrial Medical Association
American Trudeau Society
American College of Chest Physicians

Saturday, May 30

9:00-10:00 a.m. — Administrative Session
Report of the Historian
Report of the Treasurer
Report of the Executive Director
Report of the Committee on Nominations
Election of Officers

Sunday, May 31

4:00-5:00 p.m. — Board of Regents

Tuesday, June 2

6:00 p.m. — Joint Committee on Chest X-Ray, Dinner Meeting
American College of Radiology
American College of Chest Physicians

SOCIAL ACTIVITIES

Saturday, May 30

6:00-7:00 p.m. — Annual Convocation (Formal)

7:00-7:30 p.m. — Cocktail Party (sponsored by Panray Corporation)

7:30-9:30 p.m. — Annual Presidents' Banquet

9:30 p.m. — Dancing and Entertainment
Sponsored by the New York State Chapter of the College

LADIES ACTIVITIES

Thursday, May 28

Morning — Tour of the United Nations

Afternoon — Theater, "Cinerama"
(Tickets for "Cinerama" may be obtained by advance reservation)

Friday, May 29

Luncheon and Fashion Show, Cotillion Room, Hotel Pierre

Saturday, May 30

Morning — Boat trip around New York Harbor

Evening — Convocation
Cocktail Party
Presidents' Banquet
Dancing and Entertainment

INFORMATION FORM

EXECUTIVE OFFICES
AMERICAN COLLEGE OF CHEST PHYSICIANS
112 East Chestnut Street, Chicago 11, Illinois

I am planning to attend the annual meeting of the College in New York City, May 28 - 31, 1953, and will be accompanied by:

.....

I have requested reservations at the Hotel New Yorker .....

Other hotel .....

Arrival date ..... Departure date .....

I am enclosing my check in the amount of $ ..... for reservations as listed on the reverse side of this form.

Remarks .....

Name .....

Address .....

City ..... State .....

Participation in the panel discussions of the scientific program is encouraged. Will you therefore please sumit below any topics you would like to have discussed by the panels:

.....

.....

.....

.....

.....

Do you wish to submit films for the x-ray conference? .....

RESERVATION FORM

Seminars, Wednesday, May 27 **($7.50 each)**

MORNING SESSIONS 9 a.m. - 12 noon		AFTERNOON SESSIONS 1:30 - 4:30 p.m.	
First choice	A.M.	First choice	P.M.
Second choice	A.M.	Second choice	P.M.
Third choice	A.M.	Third choice	P.M.

Please indicate choice by number as listed in program.

Round Table Luncheons **($3.50 each)**

	Friday, May 29	Saturday May 30	Sunday May 31
First choice	A-	B-	C-
Second choice	A-	B-	C-
Third choice	A-	B-	C-

Please indicate choice by number as listed in program.

Luncheon, Conference of College Chapter Officials **($3.50 each)**

I wish to reserve ..... tickets for the luncheon meeting of the College Chapter Officials, Board of Regents, Board of Governors, Councils and Committees, Thursday noon, May 28.

Presidents' Banquet, Saturday, May 31 **($6.50 each)**

I wish to reserve ..... tickets for the Presidents' Banquet, Saturday, May 31. (price includes cocktails, dinner, dancing and entertainment).

NOTE: Please make checks payable to *American College of Chest Physicians*. Checks must accompany all requests for reservations and will be accepted in the order in which they are received. All tickets will be held for pick-up at the College Registration Desk, Mezzanine Floor, Hotel New Yorker.

College Chapter News

TEXAS CHAPTER

The annual meeting of the Texas Chapter will be held at the Shamrock Hotel, Houston, April 27, 1953 in conjunction with the Texas State Medical Association meeting, April 26-29. The following program will be presented by the chapter:

Morning Session

Introductory remarks:
Robert B. Morrison, President, Texas Chapter, Austin, Texas.

Presiding:
Samuel Topperman, Secretary, Texas Chapter, Tyler, Texas.

"Recent Developments in Cardiac Surgery,"
Denton Cooley, Houston, Texas.
Discussor: Don Chapman, Houston, Texas.

"The Treatment of Lung Abscess and Management of Postoperative Complications,"
Raleigh R. Ross, Austin, Texas.
Discussor: Lester Karotkin, Houston, Texas.

"Non-Tuberculous Diseases of the Lung,"
Robert B. Morrison, Austin, Texas.
Discussor: Louis Friedman, Birmingham, Alabama.

"The Newer Physiology of Respiration,"
Harry E. Hoff, Houston, Texas.
Discussor: Robert T. Clark, Jr., Ph.D., Randolph Field, Texas.

"Pneumoconiosis,"
Louis Friedman, Birmingham, Alabama.
Discussor: George Hodell, Houston, Texas.

"Present Status of Surgical Treatment of Pulmonary Tuberculosis,"
Robert R. Shaw, Dallas, Texas.
Discussor: James E. Dailey, Houston, Texas.

Luncheon: Panel Discussion, "Bronchiectasis,"
Elliot Mendenhall, Dallas, Texas; William D. Seybold, Houston, Texas; Stuart A. Wallace, Houston, Texas; J. M. Dougall, Houston, Texas.

Afternoon Session

Presiding:
Daniel Jenkins, Houston, Texas.

"Thoracotomy in Spontaneous Pneumothorax,"
Robert B. Homan, El Paso, Texas.
Discussor: Fred Aves, Houston, Texas.

"Pulmonary Function,"
Captain Loomis Bell, Randolph Field, Texas.
Discussor: Robert T. Clark, Jr., Ph.D., Randolph Field, Texas.

"Blastomycosis,"
John H. Seabury, New Orleans, Louisiana.
Discussor: Alvis E. Greer, Houston, Texas.

"The Problem of Carcinoma of the Lung,"
Michael DeBakey, Houston, Texas.
Discussor: Howard Barkley, Houston, Texas.

X-Ray Conference,
Moderator: James E. Dailey, Houston, Texas.

PENNSYLVANIA CHAPTER

The Pennsylvania Chapter will meet jointly with the Philadelphia Association of Tuberculosis Clinics at the Philadelphia County Medical Society Building, May

7, 1953. After a luncheon meeting, the following scientific program will be presented:

"Respiratory Disorders Among Welders,"
Robert Charr, Philadelphia, Pennsylvania.

"Further Observations on the Use of BCG Among American Indians,"
Samuel Stein, Philadelphia, Pennsylvania.

"Problems in Chemotherapy in Tuberculosis,"
John S. Packard, Allenwood, Pennsylvania.

"Segmental Resection of the Lung in Tuberculosis,"
Thomas J. E. O'Neill, Philadelphia, Pennsylvania.

VIRGINIA CHAPTER

The Virginia Chapter will meet at the Hotel Jefferson, Richmond, May 6, 1953. Scientific papers to be presented are as follows:

"Total Approach to the Diagnosis of Tuberculosis,"
Carl W. LaFratta, Richmond, Virginia.

"Primary Cancer of the Lung,"
Frank P. Coleman, Richmond, Virginia.

"Treatment of Chronic Bronchitis,"
W. LeRoy Dunn, Washington, D. C.

GEORGIA CHAPTER

The Georgia Chapter of the American College of Chest Physicians and the Trudeau Society will meet jointly at the De Soto Hotel, Savannah, May 13, 1953, in conjunction with the Medical Association of Georgia meeting. The program of the chest disease section is as follows:

"Management of Thoracic Trauma,"
James L. Alexander, Youngstown, Ohio.

"The Present Status of the Study Program on I.N.A.H. Therapy,"
H. E. Crow, Rome, Georgia.

"Management of Obstruction to the Outflow Tract of the Right Ventricle"
William A. Hopkins and Osler A. Abbott, Emory, Georgia.
(In conjunction with this, there will be a movie demonstration on the operation for pulmonic stenosis).

"Pneumoconiosis in Soft Coal Workers,"
Louis L. Friedman, Birmingham, Alabama.

"Diabetes and Tuberculosis,"
Sydney Jacobs, New Orleans, Louisiana.

"The Medical Profession — Responsibility to Tuberculosis Patients — A Public Health Viewpoint,"
H. C. Schenck, Atlanta, Georgia.

MINNESOTA CHAPTER

A joint meeting of the Minnesota Chapter and the Minnesota State Medical Association will be held at the St. Paul Hotel, St. Paul, Minnesota, May 20. After luncheon and a business meeting, the following program of the chapter will be integrated with the program of the state association:

"The Minnesota Medical Profession and Tuberculosis,"
Jay Arthur Myers, Minneapolis, Minnesota.

"Intrathoracic Tumors: Clinical Manifestations and Surgical Treatment,"
Stuart W. Harrington, Rochester, Minnesota.

NEW JERSEY CHAPTER

The New Jersey Chapter will hold its annual meeting at the time of the annual meeting of the New Jersey State Medical Society, at the Haddon Hall Hotel, Atlantic City, May 20. The following program on the Section on Chest Diseases has been prepared by the chapter:

"Latest Observations on the Chemotherapy of Tuberculosis with Isoniazide Experimental Aspects of Drug Resistance of Tubercle Bacilli."
Robert J. Schnitzer, Nutley, New Jersey.

"Results in Tuberculosis of Bones and Joints."
Leonard E. Kremer, Paterson, New Jersey.

"Results in Pulmonary Tuberculosis."
Irving Selikoff, Paterson, New Jersey.

General Discussion.

Progress in Thoracic Surgery:

"Pulmonary Resection — In Tuberculous and Non-Tuberculous Diseases — Indications and Results."
Herbert C. Maier, New York, New York.
Discussors: Frank Bortone, Jersey City, New Jersey.
George N. J. Sommer, Jr., Trenton, New Jersey.

"Revascularization of the Heart for Coronary Artery Disease."
Anthony D. Crecca, Newark, New Jersey.
Discussor: Alfred Henderson, Long Branch, New Jersey.

General Discussion.

CALIFORNIA CHAPTER

The California Chapter will meet in conjunction with the California State Medical Association meeting, at the Hotel Biltmore, Los Angeles, May 27, 1953. The chapter will present the following program:

"Selection of Patients for Mitral Commissurotomy."
David G. Levinson, Alfred Goldman, Morley Kert, Jerome N. Sugarman, Jack A. Sheinkopf and Maurice H. Rosenfeld, Los Angeles, California.

"Pulmonic Infections with Brucella."
Charles M. Carpenter and Benjamin Klaumann, Los Angeles, California.

"Studies on the Resistance of Pulmonary Tissue to Ischemia."
Harry A. Davis, Los Angeles, California.

"A Correlation of the Spatial Vectorcardiogram with Right Ventricular Hypertrophy."
Stephen R. Elek, Bertram J. Allenstein and George C. Griffith, Los Angeles, California.

"New Trends in Rehabilitation of Tuberculosis Patients."
John H. Aldes, Los Angeles, California.

"Culture Media for Growing Mycobacteria."
Drake Will, William Dunn and Emil Bogen, Los Angeles, California.

"The Use of a 20 to 30 Degree Reduction in Body Temperature in Cardiac Surgery."
J. Francis Dammann, Jr., Marvin Darsie and William H. Muller, Jr., Los Angeles, California.

"Cardiac Resuscitation."
Sanford E. Leeds, San Francisco, California.

"Diagnostic Problems and Therapy of Pulmonary Embolism."
John J. Sampson, San Francisco, California.

"Serum Protein Alterations in Pulmonary Tuberculosis."
I. Alfred Breckler, Alfred Goldman, Eric Stern and Mr. Robert Robinson, Los Angeles, California.

"Virus Infections of the Lung."
A. F. Rasmussen, Jr., Los Angeles, California.

"Roentgenologic Alterations of the Lung Associated with INH Therapy in Pulmonary Tuberculosis."
David Salkin and Joseph A. Schwartz, Los Angeles, California.

NEW ENGLAND STATES CHAPTER

The New England States Chapter will meet jointly with the Overholt Clinic at the Deaconess Hospital, Boston, Massachusetts, May 20, 1953. Dr. Hugh F. Hare will speak on "Management of Inoperable Malignancies Especially of the Chest."

ARIZONA CHAPTER

The Arizona Chapter will hold its annual meeting in conjunction with the Arizona State Medical Association, April 29, in Tucson. The chapter will present the following program:

"Exploratory Thoracotomy in the Management of Obscure Lesions of the Chest,"
"Surgery of Pulmonary Supperative Diseases,"
John B. Grow, Denver, Colorado.

"Combined Coccidiomycosis and Tuberculous Lesions of the Lung,"
Hans F. Stein, Tucson, Arizona.

KANSAS CHAPTER

Members of the College in the state of Kansas will meet at the El Charro Cafe, Wichita, Kansas, May 3, for the purpose of forming the Kansas Chapter.

ILLINOIS CHAPTER

The Illinois Chapter held its monthly meeting at the St. Clair Hotel, Chicago, March 27. The scientific program was presented by faculty members of the University of Illinois. The Chapter has scheduled its April meeting with the Chicago Society of Anesthesiology. On May 8, the Illinois Chapter will hold a dinner meeting in the Walton Room of the Drake Hotel, Chicago. Dr. Richard R. Trail, Governor of the College for Greater London, who is Medical Director of the Papworth Village Settlement, London, England, will speak on "The Children of Papworth Village Settlement" at this meeting.

GREEK CHAPTER

At a recent meeting of the Greek Chapter of the College, the following officers were elected:

President, Vassilios Malerdos, Athens
Vice President, Konstantine Stefanopoulos, Athens
Secretary-Treasurer, John Lameras, Athens.

The chapter will hold monthly scientific meetings in collaboration with the Tuberculosis Society.

College News Notes

A Postgraduate Course on Bronchoesophagology was presented at the Sanatorio San Angel, Mexico City, Mexico, February 2-7, 1953. The following Fellows of the College lectured at this course: Paul H. Holinger, Chicago; Donato G. Alarcon, Mexico City; Abraham Ayala Gonzalez, Mexico City; Eduardo Garcia Salazar, Mexico City and Hugo Enriquez, Mexico City.

Dr. Paul D. Crimm, Evansville, Indiana, has recently been installed as President of the Indiana State Medical Association.

Dr. Charles P. Bailey, Philadelphia, Pennsylvania, Professor of Thoracic Surgery at Hahnemann Medical College and Hospital, has been named one of ten recipients of the *Modern Medicine* awards for distinguished achievements for 1953. This award was made in recognition of his development of surgical treatment of heart disease.

Members of the College who will speak at the Industrial Medical Association Section of the 1953 Industrial Health Conference to be held at the Hotel Statler, Los Angeles, April 18-25 are: Drs. Arthur J. Vorwald, Reginald Smart, Louis L. Friedman, Hurley L. Motley, Daniel C. Braun, Burgess Gordon and Harry E. Tebrock.

ANNOUNCEMENTS

Men from a dozen medical colleges and a score of specialties will report the latest developments from the frontiers of medicine to the First Western Hemisphere Conference of the World Medical Association at Richmond, Virginia, April 24. New uses in medicine for atomic particles, hormones, and blood fractions; advances in surgery of the heart, lungs and pancreas, and new applications of psychiatry in the family doctor's day-by-day practice will be explored at the gathering of physicians from 48 states and the medical societies of Latin America.

The General Electric X-ray News Bureau states that poor contact between screens and film in x-ray film cassettes caused by the warping of the cassette front has been overcome by the new GE "Permacon" magnesium-front 14 x 17 cassette. Use of air bags and other methods of insuring permanent contact between screen and film are rendered unnecessary by the use of magnesium. Radiographic results are markedly improved by the uniformity and dependability of contact. Magnesium metal has six times the regidity of bakelite plastic, formerly used as the cassette front, and is virtually unaffected by heat and moisture. The use of Permacon cassette requires no change in x-ray technic. Sheets of magnesium are also available with which to replace bakelite in cassettes now in use. Because of magnesium's extremely light weight, the increase in weight of the new cassette over those using bakelite fronts is only 6 ounces.

The Surgeon General of the Public Health Service, Dr. Leonard A. Scheele, states that there were approximately 118,500 newly reported cases of tuberculosis in 1951. These and other new figures are given in "Tuberculosis Reported in the U. S., 1949-1951," by Dr. Robert J. Anderson and Herbert I. Sauer in an issue of *Public Health Reports*, published by the Public Health Service.

The Nepera Chemcal Company, Inc., announces the release of *Biomydrin*—a nasal solution that is isotonic, antiallergic, antibacterial and decongestant in its activity.

Book Reviews

A Half Century's Progress Against Tuberculosis in New York City, 1900 to 1950. By Godias J. Drolet and Anthony M. Lowell. New York Tuberculosis and Health Association, 1952.

It is fortunate that Godias J. Drolet and his associate, Anthony M. Lowell, prepared this volume. Mr. Drolet has been identified with the tuberculosis work of New York since near the beginning of this century. Therefore he has seen and has participated in the program throughout most of the period which this monograph covers. A review of *Tuberculosis Reference Statistical Yearbook, 1948*, together with a brief sketch of his life and the appraisal of his work were published in *Diseases of the Chest*, 18:518, 1950. Mr. Drolet founded this Yearbook and edited it annually for many years. It became one of the most important sources of information pertaining to tuberculosis in this country.

There now appears this monograph covering a half century's progress against tuberculosis in New York City from 1900 to 1950. The first 77 pages are devoted to New York City's population growth since 1800, its health problems and their solution. It is richly interspersed with photographs, maps, graphs and tables. At the opening of the 20th century the population was 3,500,000, and by 1950 it was nearly 8,000,000. "The vast hordes and streams of population which have gone through and into New York during the 50 years under consideration, the type and composition of these groups, the limited space available to them for dwelling purposes have all combined to make extremely difficult the control of a communicable disease like tuberculosis."

In 1804 the mortality rate from pulmonary tuberculosis in New York City was as high as 688 per 100,000. In 1872 it was approximately 400. By 1900 it had decreased to 237.

The chapter entitled "Milestones in the Progress Against Tuberculosis" points out that the fight against this disease had to be led from a variety of approaches, specific and general. With the discovery of the tubercle bacillus it was obvious that the first approach toward control was identification and location of the contagious cases. Then came the sanitary code which required universal reporting of cases. In 1901 a regulation was adopted to permit compulsory segregation of recalcitrant cases but it was soon realized that educational methods were more

The bovine type of tubercle bacillus was recognized as a source of disease in people. Tuberculin tests were widely administered to cattle. The reactors were sacrificed to such a degree that the incidence of infection among cattle was reduced from approximately 40 per cent in 1919 to less than one half of one per cent in 1937.

With these and many more control measures the mortality rate continued to decrease, falling from 126 in 1920 to 29 in 1950. The rather precipitous decrease in mortality in the last two or three years covered by this report was felt to be due to new drugs which have at least suppressed the disease and prolonged life.

As might be expected, children have profited most from the tuberculosis control program by reason of having been protected against tubercle bacilli. In 1898 among the 119,000 children born, 502 died from tuberculosis under one year of age. In 1950 among more than 150,000 births only 15 infants died before one year. Among children from birth to 15 years the decrease in mortality has been phenomenal. In 1900, when there were 1,053, 298 in this age period, 1,368 died from tuberculosis, but in 1950 when there were 1,644,495, only 78 died from this disease. This is a reduction of almost 98 per cent. The authors conclude with the following: "May a reviewer of the health conditions at the end of the next 50 years be able to write for men and women as we have reported for children that tuberculosis is nearing its end."

The last 79 pages of this monograph are devoted to tables, all of which pertain to tuberculosis in New York City except the final five pages, which contain the

figures over the first half of the twentieth century in the United States as a whole. Here one sees that the mortality from tuberculosis decreased from 202 per 100,000 in 1900 to 23 in 1950. From nonpulmonary forms of the disease mortality dropped from 20 in 1900 to 2 in 1950. This is one of the finest accomplishments in history.

After reading this volume one wonders if any questions concerning tuberculosis in New York City can be asked for which an answer is not available.

This monograph is an outstanding contribution produced under the direction of Godias Drolet who, by reason of previous contributions, had already been designated as one of the world's outstanding contributors in the campaign against tuberculosis.

J. Arthur Myers.

This is Your World. By Harry A. Wilmer, M.D., Ph.D. Charles C. Thomas, Publisher, 1952. Price $5.50.

"This is Your World" declares itself to be a book for the orientation of professional workers to the emotional problems of the chronically ill patient: tuberculosis and the individual. It is, indeed, that much and more in content and scope though written by one specialist for other specialists. No stereotyped presentation is found of old or common knowledge revamped for current distribution. The literary style is terse and clear without excess of minutiae so that an abundant amount of material is crystalized into a compact volume of 165 pages. Among the pictorial and artistic illustrations by the author himself, there are some magnificent conceptions and they are all ingenious and meaningful. The dialogues are sketchy, in a matter-of-fact way, but full of feeling and insight. It is to be noted that the 16 dialogues represent not only childhood conflict situations but also the child's neurosis as an index of family disturbance and as the prototype of the adult neurosis.

Simple and strong are the portrayal of the doctor's heart and the frustrated bosom of the tuberculous individual. Notwithstanding group resemblances, different patients react differently to disease and procure from the experience varying stress and support in accordance with previous behavior patterns. As mentioned by Dr. Wilmer, group interview therapy does not aim to "treat" each patient but to relieve anxiety; and the leader of group therapy contributes, for the most part, moderation or restatement of the patients' verbalization. For that reason, one need not bé a psychiatrist or psychologist to conduct such group therapy. In that connection, the author has devised a series of appropriate records for introductory use in group sessions. The therapeutic techniques proposed and utilized are of paramount interest not only to certain patients and limited professional groups but also to special students and educators.

The final chapter deals with Science and Psychiatry, pivotal in the author's work and convictions, and aims toward the achievement of better understanding between psychiatry and the other sciences, particularly the medical specialities. This chapter gives us the benefit of the editing acumen of Dr. Richard E. Scammon. Dr. Wilmer cogently refutes the shallow and impertinent thinking of some professional colleagues in recent scientific publications. The author is also critical of the application of the results of animal experimentation to psychiatry. On this point, the reviewer dissents. It is true that lower animals do not have the complicated minds and socio-cultural environment to become neurotic or psychotic in the ways known to mankind yet it is well worthwhile to test in them the proposed causes or theories that allegedly produce psychogenic disorders in human beings. Basic principles of drive, motivation, learning and perception are not species specific, and certain differences should be expected when human and subhuman creatures are compared.

Dr. Wilmer accurately points out that there is no specificity of personality profile or emotional conflicts leading to tuberculosis. He fails to recognize, however, that the more we conquer epidemic tuberculosis and materially reduce its

prevalence and incidence, the more will personality, as a factor in clinical tuberculosis, be significant. It may seem paradoxical to state on one hand that there is no specificity of personality which leads to tuberculosis and then to state that personality is a significant component of clinical tuberculosis, but in point of fact, such is a tantalizing and honest statement.

"This is Your World" is recommended as an admirable contribution and beacon to illumine contemporary thinking and practice in the medical and psychological sciences, with particular reference to tuberculosis and the individual. There is no doubt that, after reading the book, many of the professional workers in the field will want to obtain the recordings. Many others, too, will profit therefrom. To those engaged in group psychotherapy, especially among tuberculous patients, the book and recordings will prove invaluable.

P. J. Sparer.

MEDICAL SOCIETY EXECUTIVES CONFERENCE

Mr. Murray Kornfeld, Executive Director of the American College of Chest Physicians, has been appointed Chairman of the Program Committee for National Associations and has arranged the following program to be presented before the Medical Society Executives Conference at the Belmont Plaza Hotel, New York City, June 1, 1953:

"Modern Office Procedures for Maintenance of Membership Records,"
Charles E. Nyberg, Executive Assistant, American Academy of General Practice, Kansas City, Missouri.
Discussor: T. H. Sutherland, M.D., Secretary-Treasurer, Aero Medical Association, Marion, Ohio.

"Medical Society Group Insurance Plans for Health and Accident and for Malpractice,"
E. R. Loveland, Executive Secretary, American College of Physicians, Philadelphia, Pennsylvania.
Discussor: William C. Stronach, Executive Secretary, American College of Radiology, Chicago, Illinois.

"Organizing an Annual Meeting,"
Austin M. Davies, Executive Assistant, American Psychiatric Association, New York City.
Discussor: Edward C. Holmblad, M.D., Managing Director, Industrial Medical Association, Chicago, Illinois.

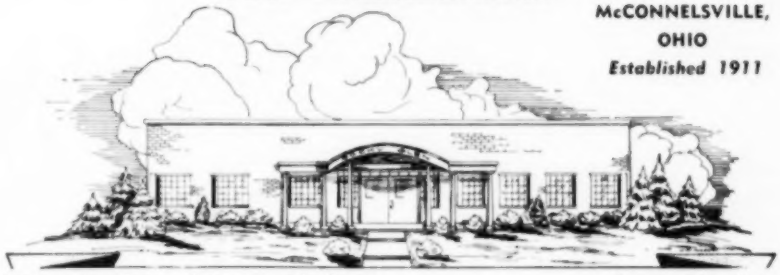
"What Is Your O.Q. (Organization Quotient)?"
Tom A. Hendricks, Secretary, Council on Medical Service, American Medical Association, Chicago, Illinois.
Discussor: Leo Brown, Director, Public Relations, American Medical Association, Chicago, Illinois.

Rocky Glen Sanatorium

FOR TUBERCULOSIS

McCONNELSVILLE, OHIO

Established 1911



Where the science of treatment is first — *Capacity 135 Beds*

FOR THE MEDICAL AND SURGICAL TREATMENT OF TUBERCULOSIS

LOUIS MARK, M.D., Medical Director, 677 North High Street, Columbus, Ohio

HARRY MARK, Superintendent — **MRS. HARRY MARK,** Asst. Superintendent

HENRY BACHMAN, M.D., Resident Medical Director

MICHAEL L. MICHAELIS, M.D., Res. Phys. — **FELIX BACHMANN, M.D.,** Res. Phys.

L. CHANDLER ROETTIG, M.D., Surgeon — **A. N. KISHLER, D.D.S.,** Attending Dentist

Beautiful Surroundings — ***Reasonable Rates***

REGIONAL MEETING "W H O" IN CUBA

The IV meeting of the Regional Committee of the World Health Organization was held at Havana, Cuba, September 15-24, 1952.

This meeting was attended by 45 delegates from 22 countries. Fourteen government and non-government organizations sent observers. The American College of Chest Physicians was represented by Dr. Antonio Navarrete, Regent and Dr. Teodosio Valledor, Governor of the College for Cuba. Dr. Fred L. Soper, Director, Pan American Sanitary Bureau and Dr. Brock Chisholm, Director-General of the World Health Organization (WHO) were in attendance.

Dr. Carlos Luis Gonzalez, of Venezuela presided at the meeting. Dr. Miguel E. Bustamantes, Secretary of the Pan American Sanitary Bureau served as Secretary.

An amount of $2,000,000 was appropriated for the fiscal year 1953 for the operation of the Pan American Sanitary Organization and the Pan American Sanitary Bureau.

The translation and publication in Spanish by Pan American Sanitary Bureau of the text book "Principles of Public Health Administration," by John Hanlon, was approved.

Brazil, Panama and Haiti were elected to fill vacancies on the Executive Committee, resulting from the expiration of the terms of office of El Salvador, Peru and the United States of America.

Dates of the meetings of the Executive Committee and the Directing Council were agreed upon and a vote of thanks was given to the Cuban Government and other agencies that cooperated in the success of the meeting.

A protocol amending the Pan American Sanitary Code was signed by the representatives of the countries present in a special ceremony at the end of the meeting.

Dr. Antonio Navarrete, *Regent*,
Dr. Teodosio Valledor, *Governor*.

ANNOUNCEMENT

The annual conclave of the American College of Allergists will be held at the Conrad Hilton Hotel, Chicago, April 24-29, 1953. For detailed information, write to the American College of Allergists, La Salle Medical Bldg., Minneapolis 2, Minn.



ALUM ROCK SANATORIUM

SAN JOSE, CALIFORNIA

TELEPHONE CLAYBURN 8-4921

A Non-profit sanatorium for the treatment of tuberculosis and other diseases of the chest.

Visiting Medical Staff:

Harold Guyon Trimble, M.D., Oakland
Cabot Brown, M.D., San Francisco
J. Lloyd Eaton, M.D., Oakland
H. Corwin Hinshaw, M.D., San Francisco
Gerald L. Crenshaw, M.D., Oakland
Glenroy N. Pierce, M.D., San Francisco
Donald F. Rowles, M.D., Oakland
James Kieran, M.D., Oakland
Robert Stone, M.D., Oakland
William B. Leftwich, M.D., Oakland

Consulting Pathologist

E. Gwyn Roberts, M.D., San Francisco

Medical Director

Buford H. Wardrip, M.D.
Telephone Clayburn 8-4921

Associate Medical Director

C. Gerald Scarborough, M.D.



100 Beds for Crippled Children ***200 Beds for Tuberculosis***

ST. JOHNS SANITARIUM, Springfield, Ill.

Complete in every detail. Rates low—because of the services of the Hospital Sisters of St. Francis.

Medical Director
DARRELL H. TRUMPE, M.D.

Address
SISTER JUDINE, R.N., Supt.



Cragmor Sanatorium

For the treatment of tuberculosis and diseases of the chest, situated near Colorado Springs in the heart of the Rockies. Ideal year-round climate. Individual apartments, with or without baths. Rates on request.

For detailed information address

HENRY W. MALY, M.D., Director
Cragmor Sanatorium
Colorado Springs, Colorado

MARYKNOLL SANATORIUM



MONROVIA, CALIFORNIA

(MARYKNOLL SISTERS)

A sanatorium for the treatment of tuberculosis and other diseases of the lungs. Located in the foothills of the Sierra Madre Mountains. Southern exposure. Accommodations are private, modern and comfortable. General care of patient is conducive to mental and physical well being.

SISTER MARY PIETA, R.N.
Superintendent

E. W. HAYES, M.D.
Medical Director

SANATORIO SAN ANGEL



MEXICO CITY, D. F.

A modern Sanatorium, finest equipment, beautiful location. All types of accommodations. Well trained medical & surgical staff. Moderate rates: Dlls. 4.50 per day and up.

Institución moderna equipada para el tratamiento médico y quirúrgico de todas las afecciones respiratorias. Cuotas moderadas, desde Dlls. 4.50 por dia.

Write for information to
DR. DONATO G. ALARCON
Medical Director
Amazonas Núm. 96, México City

ANNOUNCEMENTS

Announcement is made by the Mine Safety Appliances Company of the new "MSA Pulmonary Ventilator" designed specifically for therapy of emphysema, silicosis, asthma, and other pulmonary disorders. The new instrument is offered for use by hospitals, physicians, or on the physician's prescription, by the adequately trained patient. Prior to its formal introduction, the Pulmonary Ventilator was extensively tested clinically by Dr. Burgess Gordon, President, Woman's Medical College, Philadelphia; and was clinically evaluated by Dr. Hurley L. Motley at the Jefferson Medical College Hospital, Barton Memorial Division, Philadelphia.

Parke, Davis & Company announces that after many years of research it expects to make available to physicians soon a new antituberculosis drug, Viomycin. Parke, Davis scientists started with a soil sample from Florida in developing Viomycin, an antibiotic. The new drug has proved to be effective in discouraging the growth of "Mycobacterium tuberculosis," the organism which causes tuberculosis. It also has varied and less intense effects on other bacteria, but apparently is not active against the protozoa, fungi, or viruses which cause other diseases.

The company said Viomycin should be administered only under careful supervision of a physician.

Among the many tests conducted with the drug was one involving 72 cases of pulmonary tuberculosis at Fitzsimons Army Hospital, Denver, Colorado. Physicians reported "gratifying response in virtually all patients."

MEDICAL SERVICE BUREAU

POSITIONS WANTED

Thoracic and General Surgeon, woman, M.D., M.S. Teaching, research, and practical experience. Interested in United States or foreign location. Please include particulars in reply. Please address all inquiries to Box 272B, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

Thoracic and General Surgeon, board eligible; age 44. Several years experience and training in tuberculosis. Teacher in different medical schools. New York State license. Desires hospital or sanatorium appointment. Please address all inquiries to Box 273B, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

Physician, age 48, experienced in tuberculosis, formerly Chief of Tuberculosis Service of U. S. hospital (Guam). Seeks similar or staff position in United States. Please address all inquiries to Box 274B, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

Woman, single, tuberculosis specialist, European graduate, 19 years experience in European and Canadian tuberculosis sanatoria and hospitals, seeks residency in tuberculosis hospital or sanatorium. Please address all inquiries to Box 275B, American College of Chest Physicians, 112 East Chestnut St., Chicago 11, Illinois.

POSITIONS AVAILABLE

Staff physician wanted, 180 bed tuberculosis hospital. American graduate only, eligible for Michigan license. Salary $7,500 to $10,000, depending on qualifications and experience. Address Box 263A, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

Physician trained in internal medicine and chest diseases for private clinic. Must have license to practice in Alabama. Salary open—minimum $10,000 per year. Address Box 264A, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

Staff positions: open at state tuberculosis sanatorium in Pacific Northwest for general or special physicians. Give full qualifications, training, etc. Address Box 265A, American College of Chest Physicians, 112 East Chestnut St., Chicago 11, Ill.

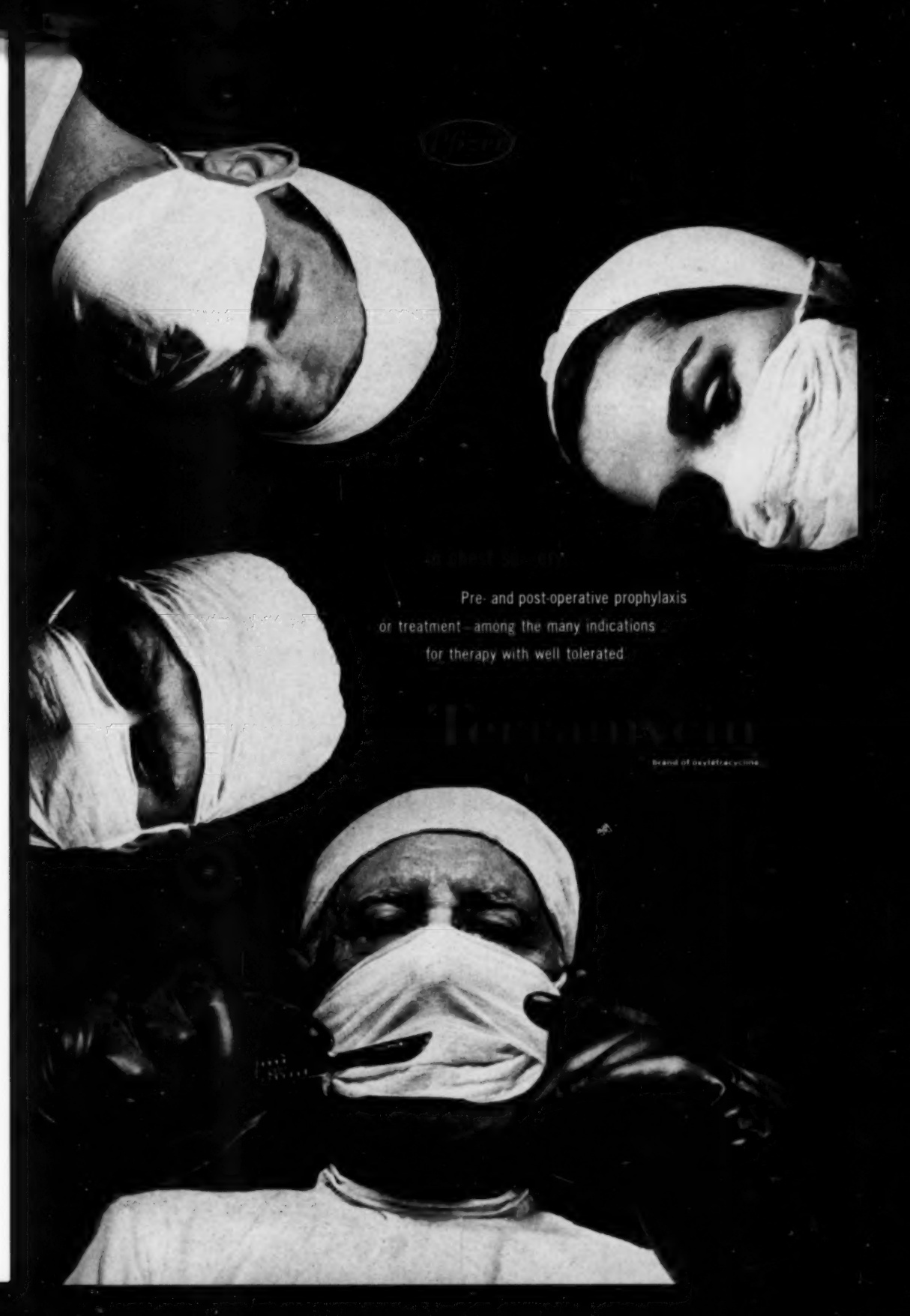
Medical Director wanted. Tuberculosis experience essential. Attractive salary, modern home, hospital approved by American College of Surgeons. The hospital is Kalamazoo County owned and has 50 beds for tuberculosis, 12 beds for county convalescent cases (female only), and 19 beds for contagious cases. Make application read, Attention: Chairman, Board of Trustees, Fairmount Hospital, Kalamazoo, Michigan.

The Veterans Administration Hospital, Downey, Illinois, has several vacancies for physicians in the 297-bed tuberculosis unit of the hospital. Salaries determined by experience and qualifications: Department of Medicine and Surgery, $5,500 to $9,600 per annum. Applicants must be between ages of 21 and 54, hold degree of Doctor of Medicine from approved institution, and must have completed approved internship, as well as posess license to practice in a state or territory of the U. S., and must meet physical qualifications. Write to the Manager, Veterans Administration Hospital, Downey, Illinois.

OFFICE EQUIPMENT FOR SALE: Physician well established in private practice of chest diseases wishes to sell x-ray, electrocardiograph, pneumothorax machines and laboratory equipment. Available on or before July 1, 1953. Please address: D. D. Douglass, M.D., 718 Frisco Building, Joplin, Missouri.

ANNOUNCEMENT

Hoffmann-La Roche, Inc. announces Gantrisin 'Roche,' the more soluble, single sulfonamide with a wider antibacterial spectrum, is now available in a new nasal solution, and Gantricillin 'Roche' which provides the combined antibacterial action of Gantrisin and penicillin G. Numerous published reports have described the effectiveness of Gantrisin as an antibacterial agent when used alone and in combination with penicillin. Gantricillin provides Gantrisin plus penicillin in a convenient oral form.


Pre- and post-operative prophylaxis
or treatment – among the many indications
for therapy with well tolerated

THE Panray CORP.

Notes on TUBERCULOSIS CHEMOTHERAPY

April, 1953

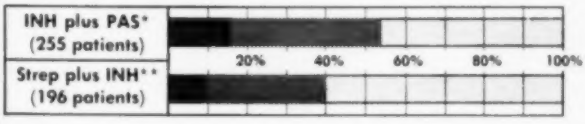
Twelfth VA-Army-Navy Conference on the Chemotherapy of Tuberculosis

In February, a 4-day conference was held in Atlanta, Georgia, attended by TB men from all parts of the country. Those present received a set of tables giving the results of various chemotherapeutic regimens as reported by 36 government hospitals. In all, 2,175 patients were treated—with isoniazid alone, isoniazid and streptomycin, isoniazid and PAS, and streptomycin plus PAS.

As was expected, isoniazid alone turned out to be not as effective as *combination therapy*. The following graphs, derived from the official report, indicate some interesting results:

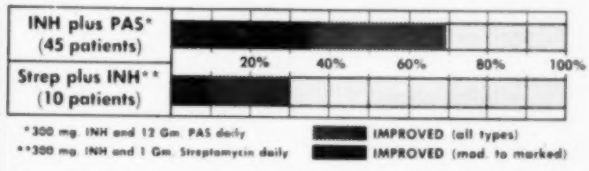
X-Ray Changes: Streptomycin-Resistant Cases

I. 2-5 MONTHS TREATMENT



When treatment is continued for more than 5 months, the results are more striking:

II. 5-10 MONTHS TREATMENT



As can be seen, the *number* of cases treated longer than 5 months is very small, and no rigorous conclusions may be drawn from the results. The data *indicates* however, that combined INH-PAS therapy may be the regimen of choice in streptomycin-resistant cases, and bear further investigation.

For investigational use, Panray provides "Buffered PARASAL-INH Tablets," each containing 0.5 Gm. PAS and 12.5 mg. INH in an *acid-buffering, sodium-free system*. Twenty-four tablets provide the accepted *full* daily dose of 12 grams of PAS (not sodium PAS) plus 300 mg. INH. Economical — convenient — exceptionally well tolerated. Write today for samples and additional information.

Research and Production for the Medical Profession

THE Panray CORP.
340 Canal Street, New York 13, N. Y.